

THE MEDICAL JOURNAL OF AUSTRALIA



VOL. II.—14TH YEAR.

SYDNEY: SATURDAY, NOVEMBER 12, 1927.

No. 20.

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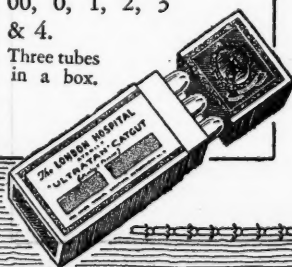


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MEDICAL APPOINTMENTS: IMPORTANT NOTICE

EDITORIAL NOTICES

PASTEUR.¹

By L. COWLISHAW, M.B. (Sydney),
Lindfield, New South Wales.

DURING the last twenty-five years three biographies of outstanding interest to medical men, all of which have become classics in literature, have been published.

Valéry Radot's "Life of Pasteur," Rickman Godlee's "Life of Lister" and Harvey Cushings "Life of Osler."

Anyone who wishes to learn about Louis Pasteur, is bound to read the book written with such devotion by his son-in-law, Valéry Radot and I may at once state that most of my paper tonight is based on that work.

I think it is a welcome break in the usual proceedings of this Branch of the British Medical Association to devote an evening to the study of and reflection on the life of one of the great men of the past. In the hurly-burly of everyday medical practice we are apt to forget the debt we owe to the past and in many cases I am afraid the average practitioner is woefully ignorant of the great ones of the profession whose labours have illumined so many dark places. We in Australia would do well to emulate the example of our French colleagues who take pleasure in celebrating the centenaries and jubilees of great men. As William Osler has written: "I hold strongly with the statement that it is a sign of a dry age when the great men of the past are held in light esteem."

Louis Pasteur, the story of whose life I propose briefly to relate to you this evening (leaving the scientific details to my friend Dr. Tebbutt), while not a medical man and only possessing honorary degrees in medicine, was one to whom the medical profession is eternally indebted.

Pasteur may truly be considered to have fully carried out the "bounden duty of a man," as set out by Thomas Fuller in one of his works "To better his heritage of birth or fortune and what the father found glass and made crystal, to find crystal and make pearl."

Louis Pasteur was born at Dôle in the Jura District in the east of France on December 27, 1822. His father, Jean Joseph Pasteur, was one of Napoleon's veterans and, serving with distinction in the Peninsula War, rose from the ranks and gained the Cross of the Legion of Honour. With the fall of Napoleon his armies were disbanded and life for the old veterans was hard and the authorities looked with suspicion on the supporters of the great Corsican.

Jean Pasteur who came of a family of tanners, went back to the tanning business and in 1815 married Jeanne Etienne Roqui who came of an old family of working folk. After one girl was lost in infancy, a second was born and in 1822 Louis. In later years two more girls.

From Dôle the family moved to the neighbouring town of Arbois and there Pasteur's boyhood was

spent in a house with a tanyard close to the town and river. And a happy and uneventful boyhood it was! Pasteur's father appears to have been a very unusual type of "old soldier." He was quiet and retiring and more eager for the society of books than for that of his neighbours and both the father and mother watched with ceaseless solicitude over the little Louis, saying: "We will make of him an educated man."

We are told that the young Louis did not always take the shortest road either to reach his classes or to return to his work at home. He was a devotee of Isaak Walton and the river bank called him more than his lessons. His one talent at this time was portrait drawing and many of these drawings, made at the age of thirteen, show great accuracy. After he had become famous as a chemist, a dear



FIGURE I.

Showing the house in which Pasteur was born, Rue des Tanneries, now Rue Pasteur, Dôle (from *L'Illustration*).

old lady of Arbois remarked: "What a pity that he should have buried himself in chemistry! He has missed his vocation, for he might by this time have made his reputation as a painter."

I have now to record the one failure of Pasteur's career. In October, 1838, he and another boy were sent to boarding school in Paris. The long journey of forty-eight hours outside the coach in bitter weather and the loneliness in Paris took the heart out of the boy of sixteen. Home-sickness claimed him as a victim. "I should get all right," he said, "if only I could smell the tanyard." One morning

¹ Read at a meeting of the New South Wales Branch of the British Medical Association on September 22, 1927.

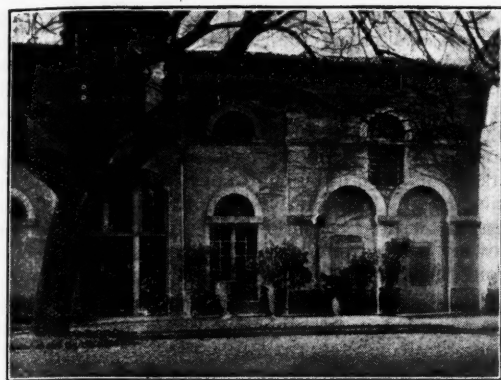


FIGURE II.

The Silkworm Nursery on the Estate of Pont-gisquet, near Alais where Pasteur carried out his Experiments (from *L'Illustration*).

his father appeared in Paris and joyfully they returned to Arbois and home. It was his first and last failure.

Suddenly he seems to have awakened to a knowledge of the sacrifices being made by his father and mother and, working hard, carried off all the prizes within his reach and we find the principal of the college at Arbois stating: "He will go far."

In 1840 he went to the Royal College of *Franche Comté* at Besançon, and here he studied and taught mathematics and received his board and lodging and three hundred francs a year (about £12 in English money). How hard he worked may be gathered from the anecdote, how invariably at four o'clock in the morning the night porter at the college entered Pasteur's room and roused him with a sound shaking and the remark: "Come, M. Pasteur, you must shake off the demon of idleness."

In 1842 he was examined for a degree in science, but coming only fourteenth on the list of candidates for the *École Normale*, he made up his mind to read for a year longer and in October, 1842, he went to Paris to join his friend Chappuis. He attended the lectures at the Sorbonne of the famous chemist J. B. Dumas whose influence over Pasteur was very great and whose friendship did much to encourage the young student. In 1843 he passed fourth and was admitted to the *École Normale* and his life work may be said to have begun.

Pasteur's life at the *École Normale* was one of constant work; his only relaxations consisted of writing letters home and receiving news from his dear ones. He told his people everything, looked up the latest methods of tanning and sent little examination papers to his father to help him to be more of a scholar.

The revolution of 1848 found him enrolled in the *Garde Nationale* and he gave all his small savings to the Republic. A few months later he experienced the greatest sorrow that had yet come to him in the death of his mother.

At this time he made his first discovery in science; he discovered the molecular disymmetry of tartaric acid and this discovery led to great advances in

organic chemistry and in the synthetic preparation of drugs. Stephen Paget tells us that it would be possible to trace the line of descent unbroken down to Ehrlich's discovery of "Salvarsan."

Valéry Radot tells us how overjoyed he was at this discovery and how he rushed out of the laboratory and meeting a curator in the passage, embraced him and dragged him out with him into the Luxembourg garden to explain his discovery.

From 1848 to 1853 he gave himself to the study of molecular disymmetry, with special reference to tartaric acid and its salts and then he went to Dijon as Professor of Physics. Finding himself side-tracked in this position, he fortunately obtained the appointment of Professor of Chemistry at Strasbourg. There, to use the words of Stephen Paget once again: "Friendship met him on the threshold and Love was waiting for him just across it." The friend was his old schoolfellow Bertin, now Professor of Physics at Strasbourg; Love was Marie Laurent, a daughter of the Rector of the Academy. Within a month he had written a formal proposal of marriage to her father.

At the end of May they were married and throughout his life she helped and comforted him and without her his work would never have been accomplished. Madame Pasteur survived her famous husband for fifteen years and her body lies near her husband's tomb with the inscription: *Socia rei humane atque divine*—a comrade in things human and divine.

The next few years were full of work and full of prophecy of discoveries to come. Writing home at the end of 1854 he says: "I think I've told you already that I was touching mysteries and that the veil over them gets thinner and thinner. So the nights seem too long for me."

The years 1852 and 1853 were occupied with chemical researches and during his vacations he travelled through Germany, Austria and Italy in quest of racemic acid. He visited chemical factories and business houses, interviewing chemists, work-

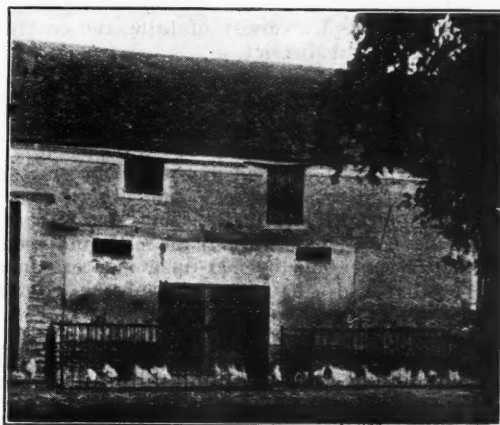


FIGURE III.

Building on the Farm of Pouilly-le-Fort, near Melun where Pasteur carried out his Experiments on *Vaccin charbonneuse*, (from *L'Illustration*).



FIGURE IV.
Pasteur and his Granddaughter (from *Medical Review of Reviews*).

men and saw with his own eyes the whole business of wine making and the knowledge thus gained was to be of great use to him in his studies on fermentation. On June 1, 1853, his dear ones at Arbois received the news that he had succeeded in converting tartaric acid into pure racemic acid and thus the labours of five years were crowned with success.

The knowledge gained of great industries during these visits was to turn his attention to industrial problems and in 1854 his chance came with his appointment as Professor and Dean of the Faculty of Science in the University of Lille, the centre of a great industrial district.

From now on his work was to lead to discoveries of the greatest importance to medicine. In 1856 he was at work on the manufacture of alcohol from beet sugar. In 1857 he published his paper on lactic acid fermentation. He had discovered in sour milk a trace of a greyish substance, had proved it to be indeed a ferment of milk, had isolated this *Bacterium lactis*, had sown it on milk and seen it act and in short had opened up a new era in the life of the world—the knowledge of the existence of bacterial life.

This memorable year was to see him back in Paris in charge of the science teaching at the *École Normale*. Here in spite of wretched accommodation, a mere garret had to serve him as a laboratory, he revolutionized the accepted facts of science. For twenty years he studied the problems of fermentation and his discoveries that all processes of fermentation, decomposition and putrefaction are

infective processes and not due to the oxygen in the air, but the living dust in the air, revolutionized not only the manufacture of wines, vinegars and beers, but was to lead Lister to his immortal discovery. In 1868 he taught the French *vignerons* how to keep their rough wines from going sour by warming them; in 1867 he taught the vinegar makers of Orleans how to speed up the fermenting vinegar; in 1871 he visited London and demonstrated with his microscope to the wondering brewers the impurity of their yeast and how to avoid the souring of their beer.

Much of his time during the years up to 1863 was occupied in proving the fallacy of the doctrine of spontaneous generation of life. It is impossible to follow this controversy through all its ramifications. The theory dates back to the time of Aristotle. In the sixteenth century a very able man, Van Helmont, could write the following extraordinary nonsense: "The smells which arise from the bottom of morasses produce frogs, slugs, leeches and other things. If one wishes to produce a pot of mice then take a dirty shirt and press it into the orifice of a vessel containing a little corn. After about twenty-one days, the ferment proceeding from the dirty shirt, modified by the odour of the corn, effects the transmutation of the wheat into mice." Van Helmont asserts that he had witnessed this phenomenon and adds: "The mice are born full grown; there are both males and females."

Experiment after experiment was devised by Pasteur to prove the exponents of spontaneous



FIGURE V.
Statue in the Courtyard of the Sorbonne, Paris, by Hugues (from *L'Illustration*).

generation wrong. He climbed the ranges of the Jura Mountains and exposed his bulbs at an elevation of 2,000 metres. No trouble was too great and finally all Paris filled the huge amphitheatre at the Sorbonne when Pasteur in his lecture on April 7, 1864, proclaimed the germ theory. "Life is the germ and the germ is life."

Meanwhile a great Englishman, hearing of Pasteur's experiments, had repeated them for himself and in 1867 Lister published in *The Lancet* his eleven cases of compound fracture under the title: "A New Method of Treating Compound Fracture, Abscess *et cetera*: With Observations on the Condition of Suppuration."

This year has seen the celebration of the centenary of Lister's birth, so there is no need for me to enlarge on his work and I will pass on to Pasteur's work on silkworm diseases.

For nearly twenty years the silk industry had been going from bad to worse; all the silk growing countries were involved, France, Italy, Spain, Greece, Turkey and China. In 1865 Pasteur took up the study of silkworm disease; by 1868 he had discovered that there were two diseases, *pébrine* and *flacheri*, which infected the worms, and had worked out a method which permitted a distinction to be made between clean and infected seed. But these three years were years of personal sorrow and were disastrous to his personal health.

In June, 1865, his father died; in September his child Camille; in May, 1866, his child Cécile. The strain of work and sorrow proved too great and in

October, 1868, he suffered a cerebral hæmorrhage and nearly died. To crown everything, in 1870 came the Franco-German War and the patriot's heart bled for his beautiful France prostrate at the feet of the German invaders.

For a while the lamp of courage seems to have burned only dimly and then seized with the idea of revenging himself on Germany he tackled the problems of brewing and placed French beers on a level with the German. From 1871 up to 1876 when he published his "*Études sur la Bière*," he worked at these problems.

The sufferings of the wounded and the dreadful mortality among lying-in women filled him with pity and in 1878 he finally vanquished the old school of thought, by drawing a picture of the streptococcus on the blackboard, as an answer to the orator who was declaiming that nobody would ever find the microbe, with the words: "Look! There, that's what it is like."

He next turned his attention to the problem of anthrax and in May, 1881, near Melun on the farm at Pouilly-le-fort he finally demonstrated his method of protecting cattle and sheep against anthrax. You are all familiar with the wonderful results which have followed the use of his treatment throughout the world since that date. Previous to this work he had discovered through his work on chicken cholera the fact of the attenuation of viruses by keeping and fresh from his victory over anthrax he gained a fresh success in the treatment of *rouget*, a disease which was very fatal to swine.

In December, 1880, Pasteur took in hand the study of rabies. I have not time to detail the story of his innumerable experiments until on July 6, 1885, he did his first inoculation on a human being in the person of the Alsatian boy, Joseph Meister, who had been bitten two days previously by a mad dog.

Joseph Meister's life was saved and he was until recently in the service of the Pasteur Institute.

In November, 1888, the Pasteur Institute was opened. It was the gift not of France alone, but of many countries to Pasteur but, as Dr. Sandwith tells us, "he was a broken and tired old man, and it was sad to see how his hard work and the opposition he had so often encountered had aged him."

The nations of the world vied with one another in showering honours on this great man. The story of these may be read in Radot's "Life." Pasteur with all his greatness was human and was very proud of his decorations and in his room at the Institute was to be seen a glass cabinet in which shone and sparkled the hundreds of orders he had received from many nations. A story is told that one day his little grand-daughter who noticed how the old man's face lit up when he gazed on this collection, remarked that they were "*Les bijoux de grand-père*."

One great scene remains before the closing one of all. On December 27, 1892, Pasteur's jubilee was celebrated in the large amphitheatre of the Sorbonne on his seventieth birthday. The President of the Republic and a vast concourse of delegates



FIGURE VI.

Entrance of the Crypt at the Pasteur Institute (from *L'Illustration*).

from learned societies were present. The city of Paris observed the occasion as a national festival and among the speakers was Lister who remarked in his speech: "Pasteur has raised the veil which for centuries had covered infectious diseases; he has discovered and demonstrated their microbial nature."

At the conclusion of Lister's speech Pasteur rose and embraced him and in the words of an onlooker "the sight of those two great men gave the impression of a brotherhood of science labouring to diminish the sorrows of humanity."

Pasteur's speech owing to his weakness was read by his son. Time will not permit me to quote it in full, I will quote only the final sentences.

"Whatever your career may be, do not let yourselves become tainted by a deprecating and barren scepticism. Do not let yourselves be discouraged by the sadness of certain hours which pass over nations. Live in the serene peace of laboratories and libraries. Say to yourselves first, 'What have I done for my instruction?' And as you gradually advance, say 'What have I done for my country?' But, whether our efforts are or are not favoured by life, let us be able to say when we come near the great goal, 'I have done what I could.'"

The few years remaining to him were occupied in guiding the work of younger men and his closing years were gladdened by the discovery of diphtheria antitoxin in 1894 by his disciple Roux.

Before describing the last scenes in this noble life, I may be permitted to read you the personal impression produced by Pasteur a short time before his death on one who knew him intimately.

Everyone knows that Pasteur is short, that since 1870 his left arm and left leg, smitten by apoplexy, are somewhat stiff and that he drags one foot, much like a wounded veteran. Age, illness, the heavy labours of so many years, the bitterness of conflict, the intense passion for his work, and, lastly, that prostration which follows triumph, have combined together to make a grand thing of his face.

Weary, traversed with deep furrows, the skin and beard both white, his hair still thick and nearly always covered with a black cap; the broad forehead wrinkled, seamed with the scars of genius, the mouth slightly drawn by paralysis, but full of kindness.

After several attacks of a uræmic nature his health failed more and more and on June 13, 1895, he bade farewell to the Pasteur Institute for ever. He retired to the farm of Villeneuve and there he died on September 28, 1895, just thirty-two years ago next Wednesday.

His passing over was as beautiful as his life. To quote from an article in *The Spectator*:

It is recorded of him that he died holding the crucifix in one hand and in the other his wife's hand. Here was a life within the limits of humanity, well nigh perfect. He worked incessantly; he went through poverty, bereavement, ill-health, opposition; he lived to see his doctrines current over all the world. For he was, it seems to me, the most perfect man who has ever entered the Kingdom of Science.

A public funeral at *Notre Dame* with military honours was accorded Pasteur by the State and his body was temporarily placed in one of the chapels of *Notre Dame*. In January, 1893, it was finally

placed in the beautiful mausoleum at the Pasteur Institute. It is indeed fitting that he should lie close to the work of the Institute, close to the heart of Paris, with Faith, Hope, Love and Science watching over him.

In the words of the poet Alfred Hayes:

No cypress-shadowed churchyard, nor the gloom
Of haunted cloisters, doth immortalise
The dust of him whose patience proved more wise
To save than Death to slay. The busy loom
Glancing with silk, the teeming herd, the bloom
Of purpling vine-yards, and the grateful eyes
Of souls reprieved at Death's most dread assize,
Shall make eternal gladness round his tomb.
Not 'mid the dead should he be laid asleep
Who wagemeth still with Death triumphant strife,
Who sowed the good that centuries shall reap,
And took its terror from the healer's knife;
Defender of the living, he shall keep
His slumber in the arsenal of life.

PASTEUR.

By A. H. TEBBUTT, D.S.O., V.D., B.A., M.B. (Syd.),
D.P.H. (Oxon.),

Director of Pathological Department, Royal Prince
Alfred Hospital, Camperdown, Sydney.

LET all young graduates take heart!

Pasteur did not distinguish himself in his classes at school or college. Perhaps he showed more promise in portrait drawing than in anything else. I will pass straight away to his scientific work.

In 1847, at the age of twenty-five, he carried out his first piece of original work which brought him immediately under the notice of the leading chemists and physicists of Paris. Mitscherlich, a learned chemist in Berlin, had recently published a note on the tartrate and paratartrate of sodium and ammonia. These two double salts are of the same chemical composition, the same refractive index, but the tartrate rotates the plane of polarized light, whilst the paratartrate does not. Pasteur asked himself: "What is there in the intimate structure of these substances which explains this difference?" After a close study of the crystalline form he discovered that the paratartrate will give equal numbers of two types of hemihedral crystals, the one as it were the mirrored image of the other, the one dextrorotatory, the other levorotatory and the resultant of the two influences on polarized light is an absence of rotation, whereas the tartrate gives only the dextrorotatory type of crystal.

For several years he devoted his spare hours—for he was a Professor in provincial universities for many years—to researches in crystallography, published some papers and in 1853 at the age of thirty-one, converted tartaric into paratartric acid, apparently a remarkable achievement, for he was made *Chevalier* of the Legion of Honour and awarded a prize of one thousand five hundred francs.

Pasteur's first contact with microbiology appears to have been about this time, for we read that he demonstrated that *Pencillium glaucum*, the green

¹ Read at a meeting of the New South Wales Branch of the British Medical Association on September 22, 1927.

mould on rotting fruit, when grown in paratartaric acid nourishes itself for some time only on the dextrorotatory component so that the solution becomes levorotatory and this mould attacks the latter component only when the former is all consumed.

Pasteur was then moved to a brewing district and we owe the ubiquity of good beer nowadays largely to his studies. Later he extended his observations to wine and vinegar. I must tell you that before Pasteur fermentation was regarded as a purely chemical process. Beer yeast and all other vegetable and animal matters in a state of putrefaction conveyed to other bodies the state of decomposition in which they themselves were. The so-called yeast cells were a precipitate of non-crystalline form, a biproduct of the chemical reaction. Pasteur used his microscope diligently and studied all the various forms of cells to be found in the very mixed culture of casks of beers, wines and vinegar and came to the conclusion that he was dealing with microscopical plants. He showed that each type of fermentation, alcoholic, lactic, acetic, butyric, was associated with a particular type of microscopical vegetation. It is interesting to note that the butyric one was a motile bacillus, a vibron as he called it and he was puzzled because he thought this should therefore belong to the animal kingdom. It was during this work that he hit upon the idea of using artificial media and pure cultures, for he made up a 10% solution of sugar in water and added mineral phosphates and an ammonium salt provided the nitrogen. You can well imagine the turmoil and criticism these unorthodox methods and ideas raised about him. But the brewers, we read, thanked him and made him a present, as they do even to this day.

About this time there was much argument in the schools and even in clerical circles as to whether "spontaneous generation" was or was not a continuing phenomenon in Nature. A prize was offered by the French Academy for new light on this subject. One of Pasteur's friends, a distinguished chemist, apparently regarded the subject in much the same light as we orthodox people regard spiritualism nowadays, for he tried to dissuade Pasteur with these words: "I should not advise anyone to devote much time to such a subject." Another said: "It is insoluble." Yet Pasteur in a short period did solve it and won the prize with some of the most beautiful experiments of all time. You will remember that in those days nearly all vegetable infusions went bad. They did not both efficiently sterilize them and keep out the dust of the air afterwards. If they did happen to remain clear, the infusions had lost, they said, their "vegetative force." This reminds us of the "dormitive virtue" of opium alluded to by another great Frenchman. Pasteur showed that it was the dust of the air that carried the germs of putrefaction and fermentation, that if you boiled your infusion and whilst the steam was still escaping plugged with cotton wool or sealed the neck of the flask with a flame or even drew it out in swan's neck fashion, an infusion would keep indefinitely. From these

and other experiments of Pasteur come your "bully beef," your condensed milk and your tinned peaches—Pasteurization.¹

And the good work of Pasteur was ably continued during his declining years and after his death in 1895 by his able pupils. Before the master's death Roux and Yersin's work on diphtheria had produced the antitoxin, the wonders of which startled the whole world.

Many other methods followed very soon from Pasteur's ideas, for example the work of Wright and others on prophylaxis and treatment by bacterial vaccines.

Some of Pasteur's opinions I have thought well worth bringing to your notice. Many discoveries of science have apparently followed chance observations. Of this Pasteur said: "In the field of observation chance favours only the trained mind." Then, with regard to patriotism, Pasteur who was a very human person and had his full share of Gallic fire, was very incensed by the German bombardment of a museum during the Franco-Prussian War and returned an illuminated address and diploma from a German University with an emphatic gesture of contempt. On the subject of internationalism he said: "Science is international, but a scientist cannot help belonging to the native land which he loves."

There were many acrimonious discussions even in those days on the subject of religion and science and Pasteur's pronouncement shows his wide tolerance and fine sensitiveness and at the same time the great wisdom of his nature. "In each one of us," he said before the Academy of Medicine, "there are two individuals, one the man of science who has thrown aside old notions and who by observations, experiment and reasoning desires to obtain a knowledge of Nature; the other the man of feeling, of tradition, faith or doubt; the man of sentiment who weeps at the death of his children, who cannot prove that he will see them again, but believes and hopes that he will; who does not wish to die like a vibron and says that the force within him will be transformed. The two domains are distinct and woe to him who wishes to make them encroach on one another in the imperfect state of our knowledge."

If the ubiquitous man in the street were asked who was the greatest man in the Nineteenth Century, he would probably first call to mind a great statesman or soldier; if he were asked to name the greatest discovery, he would mention the steam engine, the telegraph or the telephone; but we who know mankind better in his weakness than in his strength, know also what were the greatest discoveries for man's amelioration. They were the revelation of the relation of microorganisms to disease and from this directly the prevention or control of epidemics, the specific cure of many infective diseases and the virtual extinction of the terrifying sepsis and hospital gangrene following operations in the days before Pasteur and Lister. With these discoveries I couple those of anæsthetics

¹ At this stage of his address Dr. Tebbutt gave a résumé of Pasteur's work on silk-worm disease, chicken cholera, anthrax, rabies and puerperal infections. He illustrated his remarks by lantern slides.

as the greatest in the Nineteenth Century. Who is there that has been ill would give them up for the telephone?

And the greatest of these giants was Pasteur. We marvel at his imagination, his prevision, his confidence, his industry. To be cut down with a paralytic stroke at forty-six years and yet to do much of his most valuable work afterwards shows extraordinary persistence and fibre. Industry without imagination is commendable, imagination without industry is reprehensible, imagination and industry are genius. And with the passage of the years Pasteur's star grows even brighter.

The line of Virgil, referring to Lucretius, is his best epitaph:

Felix qui potuit rerum cognoscere causas.

LIVER FEEDING IN PERNICIOUS ANÆMIA.¹

By CHARLES A. ELLIOTT, M.D.,

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PERNICIOUS anæmia has remained a baffling disease in spite of the extraordinary number of contributions that have appeared since Addison's classical description of 1849 and Biermer's work of 1868 which established the symptom complex as an apparent clinical entity. Evans in a monograph published in 1926 reviewed our knowledge of the subject and indicated the lines of investigation that promised to yield information as to the pathogenesis of the disease. As regards treatment the recommendation of general building up measures, a well balanced diet including meat, exposure to the mercury vapour lamp and blood transfusions, together with a discussion of splenectomy reflects a discouraging outlook.

Various therapeutic measures have within our memories aroused waves of enthusiasm followed by disappointment. Evaluation of remedial agents has been made difficult, has required prolonged trial, since pernicious anæmia is a disease of spontaneous and often of repeated remissions. Recent results with the feeding of liver have again aroused hopes that finally something of permanent value is available. The early and conservative reports of Minot and Murphy in 1926 on forty-five cases were naturally received with scepticism. Sufficient time has now elapsed (for example, Minot and his associates have data on one hundred and five patients) to indicate that a therapeutic measure is at hand that gives better results than any hitherto available. That a cure for pernicious anæmia has been discovered is not claimed. It is too early

to predict the outcome of patients who continue liver feedings. It has, however, been definitely established that the daily feeding of sufficient liver will be followed by a prompt remission of the anæmia and by general clinical improvement.

It is instructive to recall the physiological background of the clinical use of liver feeding. Whipple and his coworkers whose studies of experimental anæmia in dogs date from 1920 to the present time, discovered that blood regeneration and bile pigment excretion are influenced by modifications of the diet. They reported in 1925 that bile pigment excretion was found to be increased on a carbohydrate and decreased on a protein diet, while hæmoglobin regeneration was slow on a carbohydrate and rapid on a protein and especially on a liver diet. Liver was found to have a uniform and maximal influence on hæmoglobin and red cell production, distinctly more favourable than that of muscle and green vegetables. Whipple has noted, moreover, a quantitative relation of the amount of liver fed to the amount of hæmoglobin produced. Thus the feeding of four hundred grammes of liver daily was followed by the production of one hundred grammes of hæmoglobin while two hundred and fifty grammes of liver produced from thirty-five to seventy grammes of hæmoglobin.

Clinical application of Whipple's early work was favourably reported by Gibson and Howard in 1923, but without decisive results. Application of Whipple's later findings was reported by Minot and Murphy. As already stated, they reported remissions in forty-five cases of pernicious anæmia and the observation that in the first week of liver feeding the reticulocytes in the blood rose to as high as 20% or more. More recent data of Minot and his

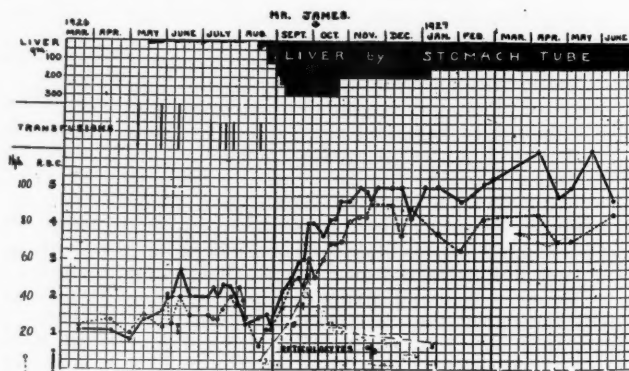


CHART I.

Pernicious Anæmia was present for two years. During the first five months in the hospital he received treatment as usual with us prior to the use of liver feeding; that is, a well balanced diet, hydrochloric acid, cod liver oil, quartz lamp radiation and blood transfusions. In May, 1926, after Minot's first report, liver feedings were attempted, but the patient had never eaten, indeed had always hated liver. His tongue had become so sore that applications of cocaine were necessary before meals. Cord changes were marked. In August, 1926, administration of liver by stomach tube was begun and a remarkable transformation followed. His tongue became normal, reticulocytes increased and later decreased to normal as the red blood count rapidly mounted to normal where it has remained. Many cord symptoms (tingling *et cetera*) disappeared, but he retained evidence of posterior-lateral cord degeneration. Gastric acidity has not been affected. The patient still elects to take his liver by stomach tube.

¹One of a series of post-graduate lectures delivered at Melbourne, August 23, 1927.

RED COUNTS IN 7 CASES OF P. A.
FIRST 2 MONTHS OF LIVER FEEDING

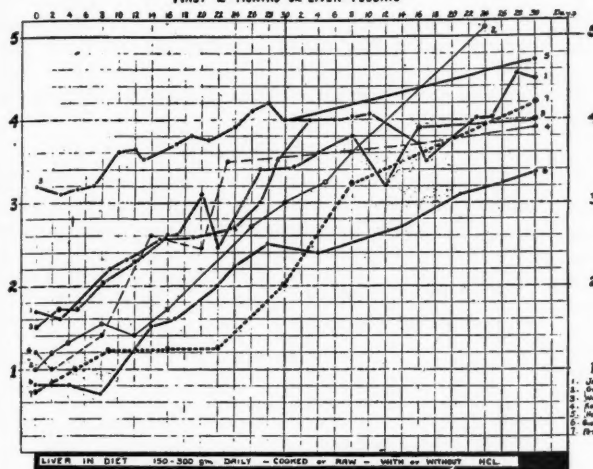


CHART II.
Curves Illustrating the Effects of Liver Feeding on the Red Blood Count during the First Two Months.

associates concerning one hundred and five patients treated for three months to three years with a diet rich in mammalian liver (two hundred grammes cooked weight daily) show that essentially all patients with the disease can be benefited. This improvement is usually rapid and striking and there is a marked and prompt increase of the red blood corpuscles in almost every case. The red blood cells of ninety-nine patients reached four million or more per cubic millimetre and if the diet were adequate, this level was reached within about two months. The counts have remained at or above four million except for temporary, seldom marked drops in approximately 15%, particularly associated with the partial or complete omission of the prescribed amount of liver. Failure to take a sufficient amount of liver or the presence of a complication, such as an infectious process, may cause the count to fall or may cause it to rise less rapidly than might be expected. Damage to the bone marrow from multiple transfusions of blood may be a reason for an unsatisfactory response to liver feeding.

What there is in mammalian liver that produces blood regeneration is as yet unknown. Liver is, of course, rich in iron and vitamins. Rich in nucleo-proteins, it contains protein of high quality as compared with the total amount. In this connexion it is of interest to recall reports of the stimulation of red blood cells experimentally by the injection of nucleic acids. Koessler and his associates, observing results similar to those of Minot with a diet rich in vitamins, including liver, ascribed the favourable results to vitamins and from experiments on rats postulated a vitamin deficiency basis for pernicious anemia. While a well balanced diet containing sufficient vitamins is desirable in disease as well as in health, it is

certain that the benefit in pernicious anemia is not derived solely from vitamins nor from iron or protein since Minot isolated from beef liver a non-protein, alcohol insoluble fraction which causes a prompt, marked, temporary rise of reticulocytes and a rapid increase of red blood cells. To obtain beneficial results the patient is required to take daily only ten grammes of this substance. Of other viscera rich in nucleo-proteins kidney seems to produce results similar to those obtained from liver.

A possible explanation of the effect of liver has been given by Minot and Murphy on the basis of the behaviour of the reticulocytes. It has long been known that in relapses of pernicious anemia the bone marrow contains masses of megaloblasts which are absent in secondary anemia. The feeding of liver in pernicious anemia causes a marked and rapid rise of reticulocytes. In the first week, especially if the red count is around one million, they may reach 20% to 50%, after which, as the red cells increase, they again fall to a low level. The reticulocyte

PROGRESS OF PATIENTS WITH PERNICIOUS ANEMIA ON LIVER FEEDING.

Name.	Count before Liver Feeding. Million R.B.C.	Time Interval to 4 Million R.B.C. Weeks.	Duration to Present Months.	Present Blood count Million R.B.C.
Dr. M. ..	2.10	6	10	4.9
Mr. L. ..	2.25	7	12	4.7
Mrs. W. ..	1.50	7	8	4.0
Mrs. K. ..	1.00	6	3	4.3
Mr. F. ..	0.90	9	6	4.4
Mr. McV. ..	2.20	7	13	4.5
Mr. J. ..	1.20	6	10	6.3
Mr. H. ..	3.00	5	5	5.0
Mr. Go. ..	1.00	6	5	6.4
Mr. Gu. ..	0.90	9	4	5.5
Mr. L. ..	3.70	2	9	6.0

TABLE I.

This table is a tabulation of eleven cases of Pernicious Anemia, showing the initial red cell count, the time required to increase to four million and the present count with duration of treatment.

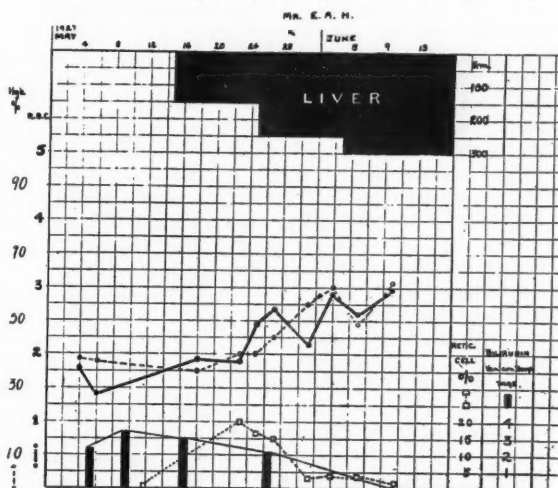


CHART III.

This illustrates the disappearance of abnormally high values of bilirubin in the blood as measured by the Van den Bergh test. It shows also the increase of reticulocytes coincident with the increase in red cells and the subsequent fall to normal during the first few weeks of liver feeding in a case of pernicious anemia.

increase is thus approximately inversely proportional to the height of the red blood count. This is to be expected as there are few megaloblasts in the marrow when the count of the red blood cells is relatively high. In secondary anaemia liver feeding does not produce a significant increase in reticulocytes. From these observations Minot and Murphy conclude that liver or something contained in it probably stimulates the maturation of megaloblasts in the bone marrow.

Concerning treatment, it is necessary only to add liver to an adequate, well balanced diet. The liver may be given in any form, boiled, fried, as a *purée* or raw. Some patients prefer to drink well ground raw liver diluted, as with orange juice. In several cases we have found it advisable to supply it by stomach tube. Hydrochloric acid is not a necessity but we have continued to use it in most of our cases. Other treatment is subsidiary.

As the red count rises, the haemoglobin increases, but the colour index falls below one. As the count approaches normal, the megalocytes and irregular forms become fewer and fewer, until finally it may be impossible to distinguish the smears from those of normal blood. Coincident with the rise in the blood count general improvement takes place. The bilirubinæmia, as measured by the Van den Bergh method or by the icterus index, decreases to normal and the lemon tint of the skin disappears. Glossitis usually clears up quickly as do the gastro-intestinal symptoms. The gastric anacidity has, however, persisted in the cases examined. Cord changes have naturally remained, although such symptoms as numbness and tingling have decreased or disappeared. To date the remissions produced have been maintained provided patients have continued their liver feeding.

Our own series comprises fourteen cases. Of these eleven patients with true pernicious anaemia have all experienced complete remissions of their anaemia and have had a corresponding general clinical improvement. Data concerning these eleven cases are included in the accompanying charts and drawings from microphotographs of blood specimens.

Data from three cases are not included. One patient whose condition has undergone a striking improvement, received liver for only one month and has, therefore, not been included. Two patients, elderly and extremely debilitated, were given raw liver in *purée* by stomach tube. They were definitely improving, but developed suppurative bronchopneumonia and died. The method of feeding may have predisposed to the development of the pneumonia. Data from these two fatal cases are also not included in the charts.

Other types of severe anaemia did not show the marked response to liver feeding seen in the pernicious type. One case of benzol poisoning with severe anaemia showed benefit, but met the characteristic response to liver feeding seen in pernicious anaemia. One case of severe anaemia of the aplastic type, simulating pernicious anaemia with jaundice, but with free hydrochloric acid in the stomach content and running an intermittent low grade fever course, did not respond to liver feeding. One

patient with sprue with a blood picture simulating pernicious anaemia responded to liver feeding as far as the blood picture was concerned, but developed tetany and a low blood calcium on the liver diet. The tetany disappeared on discontinuing liver feeding and on the administration of calcium lactate, but the anaemia returned.

Summary.

The addition of sufficient liver daily to an adequate, well balanced diet supplies a therapeutic agent that will produce a prompt remission in practically all cases of pernicious anaemia. A cure is not claimed. The response to liver feeding on the part of the reticulocytes seems to be characteristic of pernicious anaemia.

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RUBIN'S INSUFFLATION TEST.¹

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I HAVE been deputed to demonstrate Rubin's insufflation test for patency of the Fallopian tubes, but before doing so I have thought it advisable to touch upon the subject of sterility so that you may better understand the rationale of the test.

While it has been known that the patency of the tubes is a *sine qua non* for the occurrence of pregnancy ever since the physiology of the pelvic organs has been worked out, yet in the clinical examination and treatment of sterility attention has until recently almost exclusively been devoted to the position of the uterus and the condition of the cervical canal.

The Older Treatment of Sterility Empirical and Inadequate.

That is to say inaccessibility of the os and obstruction in the cervical canal have been regarded

¹ A post-graduate lecture delivered at Brisbane, August, 1927.

ILLUSTRATIONS TO THE ARTICLE BY PROFESSOR CHARLES ELLIOTT.

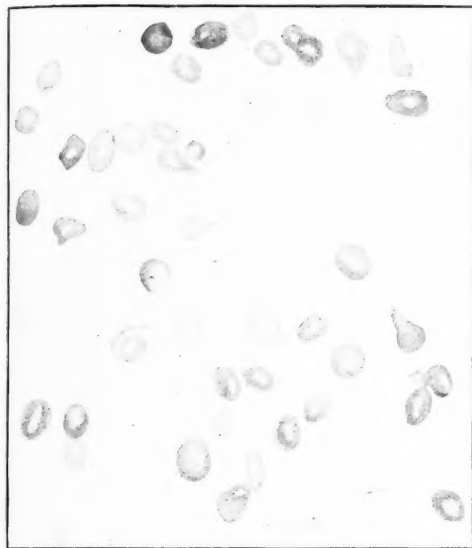


FIGURE I.

Drawing from a Photomicrograph of Blood from a Case of Pernicious Anæmia before Beginning of Liver Feeding.

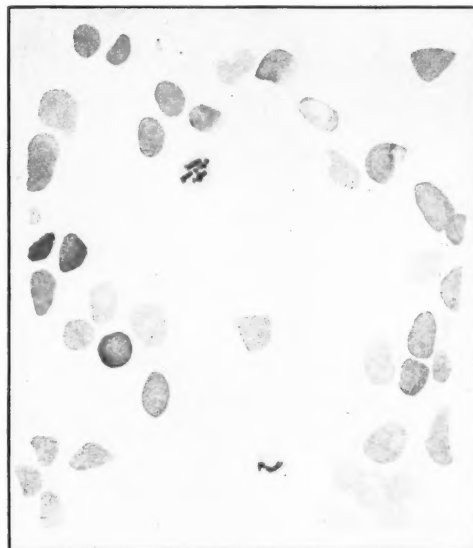


FIGURE II.

Same as Figure I One Week after Beginning Liver Feeding. Note reticulocytes, stained by vital stain (a drop of blood with cresyl blue) smeared and stained with Wright's stain.

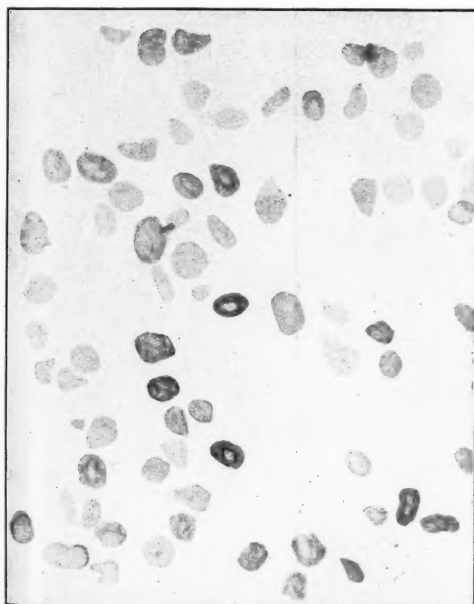


FIGURE III.

The Same after Two Weeks of Liver Feeding.

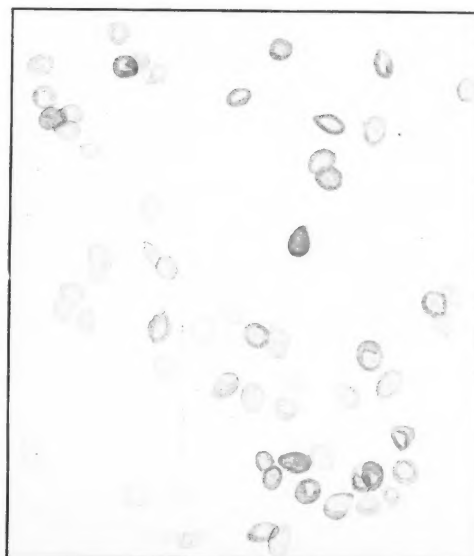


FIGURE IV.

The Same after Three Weeks of Liver Feeding.



ILLUSTRATIONS TO THE ARTICLE BY PROFESSOR CHARLES ELLIOTT.

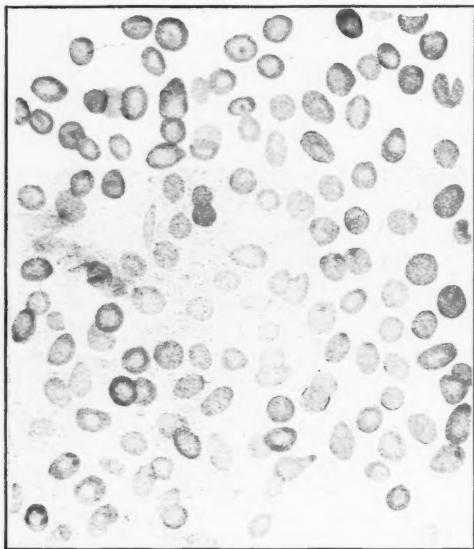


FIGURE V.
The Same after Four Weeks of Liver Feeding. Note almost normal appearance.

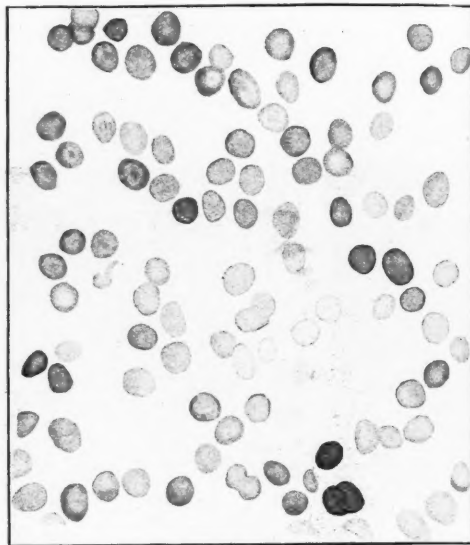


FIGURE VI.
The Same after Two Months of Liver Feeding, difficult to Distinguish from Normal. Note absence of megalocytes.

ILLUSTRATION TO THE ARTICLE BY DR. C. E. CORLETTE.



Figure Showing Fracture of Anterior Inferior Spine of the Ilium.

ILLUSTRATIONS TO THE ARTICLE BY DR. M. GRAHAM SUTTON.

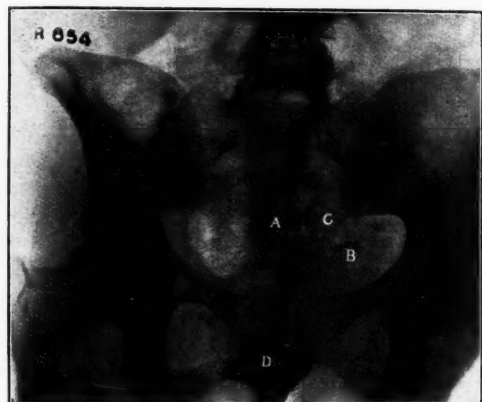


FIGURE VI.



FIGURE VII.



FIGURE VIII.

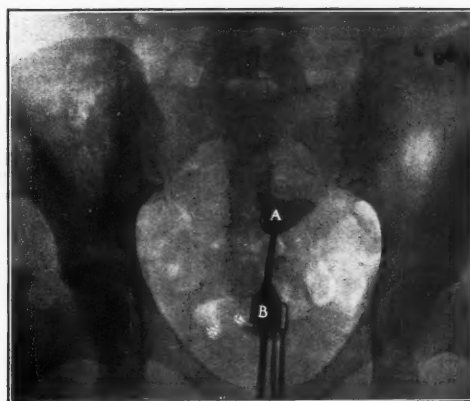


FIGURE IX.

ILLUSTRATIONS TO THE ARTICLE BY DR. J. WITTON FLYNN.



FIGURE I.
Showing Plantar Aspect of Lesion. The cone shaped areas are prominent. Note the involvement of the nail of the little toe on the right foot.



FIGURE II.
Plantar and Medial Aspects of Right Foot. On the medial aspect early lesions are seen.



FIGURE III.
Lateral Aspect of Right Foot. Note the rupia-like appearance of uppermost lesions. Involvement of the nail is also shown.

as the conditions hindering the passage of the spermatozoa instead of occlusion of the tubes, the passage of the ovum in spite of the fact that the cervical canal, if it is large enough to permit the escape of the menstrual fluid, must be sufficiently large to admit the spermatozoa.

Of course this is not to say that reposition of the uterus and dilatation of the cervix have not been attended with success, often enough to justify their execution when there is no doubt that the other organs are normal.

The Raison d'Être of the Test.

Neglect of the condition of the Fallopian tubes as a causal factor in examinations for sterility has been due to: (i) The absence of physical signs of disease of the tubes on bimanual examination; (ii) the absence of any method short of laparotomy whereby obstruction could be diagnosed apart from palpation of a definite swelling or induration.

Investigation of the tubes at laparotomy by the passage of a fine probe or the injection of fluid, coloured or otherwise, has demonstrated that obstruction can exist though nothing can be seen or nothing felt *per vaginam* to reveal such obstruction.

Similarly the tubes have been found closed at their ostia by fine filmy adhesions far too delicate to be felt *per vaginam*.

Other causes of obstruction are spasm, congenital non-canalization of the tubes and congenital synechiae of the fimbrial ends.

Historical.

As a means to the diagnosis of these tubal conditions we have until recently had to depend upon a history of a previous infection or an abortion or a curettage or a uterine instrumentation to determine the probable occlusion of the tubes.

In 1910, however, Cary⁽¹⁾ showed that it was possible to demonstrate the patency of the tubes by injecting them with a solution of "Argyrol" and having them examined by X rays.

Then in 1919 Rubin⁽²⁾ proved that it was possible to pass oxygen or carbon dioxide gas through the internal os into the uterine cavity under low pressure and if the tubes were open, to produce a pneumoperitoneum which could be demonstrated by X rays and other means and that if, on the other hand, the tubes were blocked, gas would fail to pass.

This procedure is now known as Rubin's test.

Aside from a clinical diagnostic value, tubal insufflation in certain cases aids the sterile woman and therefore may be said to have a therapeutic value.

Limitations of the Test.

Like many other tests it may not be applied in every case in a haphazard way and be expected to reveal the cause of sterility automatically, but must be used with intelligence and the result obtained by it must be supported by all other applicable clinical methods, including, of course, a very careful history.

Apart from the male factor, which by the way accounts for from 15% to 20% of cases, and the mechanical factors in the female (for example, acute antelexion of the uterus, the external os being out of the seminal pool, torn perineum, hypertrophic elongation of the cervix *et cetera et cetera*) the most generally met with causal factor in sterility is, of course, infection.

Pathology of Tubal Occlusion.

Pelvic infection may be either of gonorrhœal or septic origin.

The most common seat of pelvic infection is primarily in or about the cervix from whence it is apt to spread with more or less far reaching results.

Fortunately cervical gonorrhœa remains a local infection, unless the primary infection occurs at or near the menstrual period or unless it is carried up past the internal os by the doctor in attempts at over-treatment or by dilatation and curettage or other intrauterine instrumentation, when it spreads in characteristic fashion almost invariably along the uterine mucosa into the tubes, the fimbrial ends of which become sealed up and indrawn.

On the other hand infection by septic organisms, notably the streptococcus, can nearly always be traced to labour or miscarriage. Aside from labour or miscarriage, septic infection may, of course, be due to curettage or other uterine operation, intra-uterine medication or sounding, a stem pessary or the presence of a fibroid. If a pelvic inflammatory trouble cannot be traced to one of these causes, it is almost certainly not streptococcal.

Not all puerperal cases, however, are staphylococcal or streptococcal; about 25% are gonorrhœal. They are usually of a mild type and subside quickly and this, of course, may be the case with the septic type.

Unlike the gonococcus, the streptococcus does not progress along the mucosa into the tube, but either penetrates the wall of the uterus or spreads by the lymphatics through the parametrium to the subperitoneal connective tissue and causes a perioophoritis and a perisalpingitis.

The reason for making a distinction between these two main classes of infection is that in the endosalpingeal group—the gonococcal—the ciliated epithelium of the tube is destroyed and the sealed end of the tube indrawn (see Figure I). The prognosis for plastic surgery is therefore not good; whereas in the perisalpingeal group—the septic—the ovary is surrounded by adhesions and the tubal end is distorted by them but the epithelium lining the tube is intact. Consequently when these adhesions are freed the tube is more likely to function again (see Figure II).

Importance of Careful Clinical History.

Thus in taking the history care must be taken not to miss an early miscarriage or an intrauterine treatment and the mildness of the attack must not be given too much weight.

Therefore in the diagnosis of the probable cause of the sterility a history of gonorrhœal infection or a suspicion of it, namely, scalding on urination and



FIGURE I.

The Gonorrhoeal Type of Tubal Occlusion. Note the fimbriated end is sealed and indrawn and the ovary is free. If there is no occlusion, of course tubo-ovarian adhesions and abscess may develop.

a discharge soon after marriage, should always suggest a sterility due to endosalpingitis or endocervicitis, while the story of curettage, abortion or *post-partum* or post-operative infection should suggest parametrial extension with peritubal or periovarian involvement. The former is nearly always bilateral, while the latter may involve only one side.

The Indications for Peruterine Insufflation.

The indications for peruterine insufflation are given by Rubin as follows:

1. Primary sterility in which contributing causes, including those for which the husband might be responsible, have been eliminated and some operative procedure is contemplated.
2. Primary sterility in which the patient is known to have passed a gonorrhoeal pelvic infection soon after marriage and is at the time free from pelvic symptoms and signs.
3. Sterility following a pelvic exudate or abscess complicating a puerperium or abortion with or without the history of operation in which resolution has apparently taken place.
4. Primary sterility in which the patient has had peritonitis of appendicular origin to exclude occlusion by tubal adhesions.

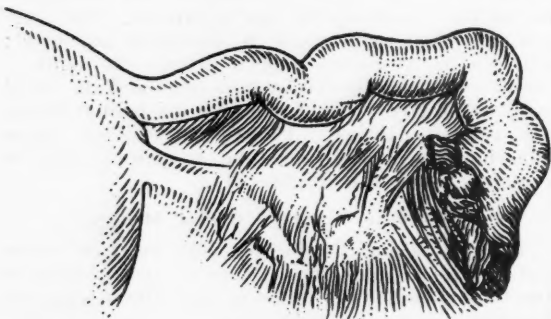


FIGURE II.

The Septic Type of Tubal Occlusion. The fimbriated end of the tube is distorted by pelvic peritoneal adhesions and the ovary is embedded in them.

5. One child sterility without a definite history of pelvic infection.

6. After conservative surgery on the tubes (salpingostomy) to determine the success of the operation which was calculated to effect an opening of occluded tubes.

7. After unilateral ectopic pregnancy to determine the patency of the remaining tube.

8. After sterilization by tubal ligation to test the patency of the tied or severed tube.

9. After multiple myomectomy to make certain that at least the uterine ostium of the tube has been left intact.

The Therapeutic Value of Tubal Insufflation.

In addition to diagnosis the instrument also has a "curative" value inasmuch as:

1. Mild agglutinations of the folds of the tubal mucosa (a potent cause of tubal pregnancy) may be separated.
2. Inspissated mucus may be dislodged from a narrow to a wider portion of the tube.
3. Small delicate adhesions at the fimbriated end of the tube can be broken down by a pressure of 150 to 200 millimetres, thus opening the way for the descending ovum to meet the ascending spermatozoa.
4. Still another factor not to be lost sight of is the psychic impression made on the patient. The exact nervous mechanism of this is not clear at present.

Whether it is the psyche acting through the genital autonomic system causing spasm of the tubes or of their uterine ostia must await further investigation.

That there actually exists in certain tubes spasm sufficient to close their uterine openings in a manner similar to the closure of the internal os has been demonstrated by both Rubin and Kennedy.

This relaxation of spasm can be surmised, if in a woman of neurotic temperament (without an anaesthetic) the pressure at which gas enters the peritoneal cavity becomes successively lower by steps at each application of the cannula. While in Melbourne, I was fortunate enough to witness such a case demonstrated by Dr. H. Jacobs who has had first hand knowledge of the test from its originator, Rubin, in New York.

Method of Performing the Test.

The use of the apparatus is extremely simple.

The patient is prepared as for the operation of curettage. An anaesthetic is not necessary and is in fact a drawback. Rubin never uses an anaesthetic, I believe. The apparatus consists essentially of four parts (see Figure III): (i) A supply of carbon dioxide from a sparklet bulb or a cylinder, (ii) a volumeter, (iii) a manometer, (iv) a cannula.

These are connected by rubber tubing and the gas is controlled by suitable valves (see *a* and *b* in Figure III) to enable the operator to calibrate the instrument as I shall explain later.

Sufficient water has been placed in a jar to cover the shoulder of the bell—the volumeter.

After the cervix has been grasped with a volsellum and the canal has been painted with tincture of iodine the cannula is inserted through the internal os and pressed firmly into position. The taps are turned on so as to allow a steady stream of gas to enter the uterine cavity. The manometer will then rise while the level of the water in the bell will be depressed until the latter is entirely full of gas and the water completely displaced.

When this has occurred fifty cubic centimetres of gas have passed and the manometer will rise to from sixty to eighty millimetres at which level it will remain stationary so long as the escape of gas is fairly slow, that is to say at such a rate that one hundred millimetres of mercury pressure will be attained in twenty seconds of time. This standard of calibration is known as Rubin's ratio and enables comparable observations to be made by any individual observer in any part of the world. In this way cases may be recorded and classified on a uniform basis.

The signs that gas has entered the abdomen are: (i) The behaviour of the manometer, (ii) the detection of the escaping gas by auscultation with a

stethoscope in each iliac fossa, (iii) the demonstration of a pneumoperitoneum.

Rubin always uses X rays to confirm this. It may, however, be proved by making the patient sit up, when a pain referred to one or other shoulder, usually the right, will be complained of; this is due to gas floating up under the diaphragm and irritating the phrenic nerve.

When both tubes are blocked, some information as to the site of the occlusion can be gained in the conscious patient by the situation of the local pain caused by the pressure of the gas. When only one tube is blocked at the isthmus, the pain is felt one or other side paramedially. When the occlusion is at the fimbriated extremity of the tube, pain is referred quite characteristically to a point in juxta position to the anterior superior iliac spine.

The behaviour of the manometer needs further attention.

Occasionally the pressure at first may rise to one hundred millimetres or more, after which it will quickly drop back to sixty or eighty millimetres, at which level it will remain. Probably the mucus in the tube has been moved along. During the time that the gas is passing, the stethoscope will reveal

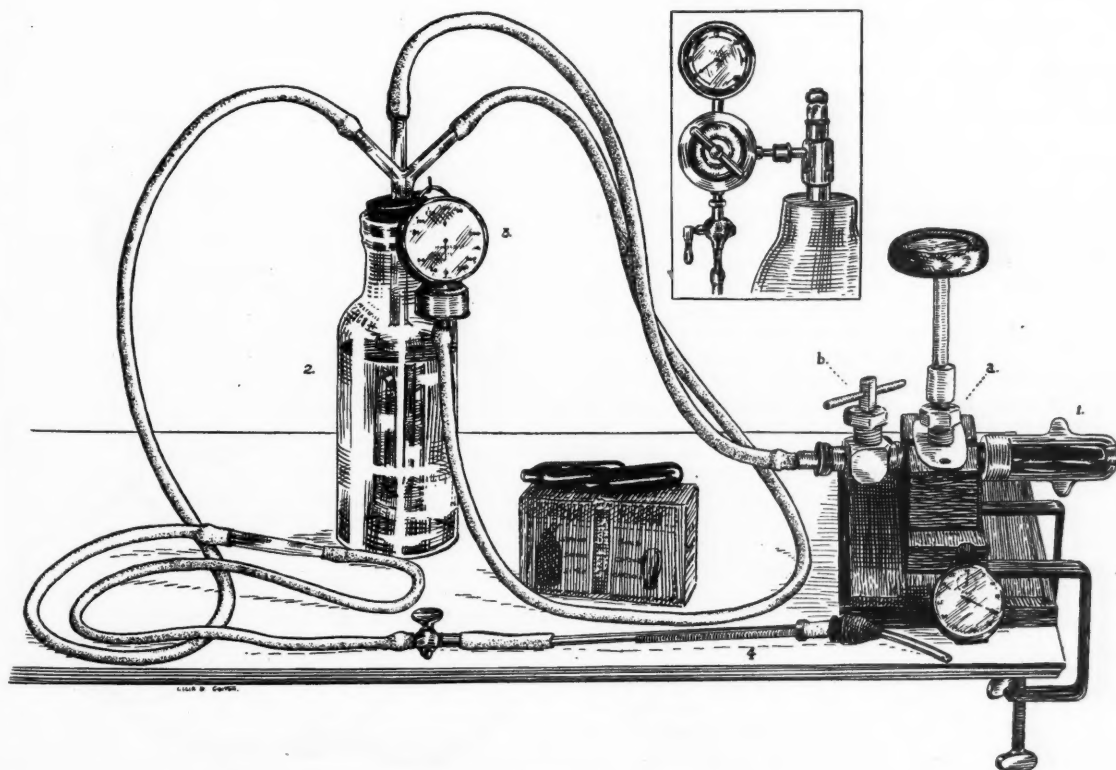


FIGURE III.

A Modification of Rubin's Apparatus for the Inflation Test for Patency of the Fallopian Tubes. 1 = the sparklet bulb supplying carbon dioxide. Inset shows carbon dioxide gas cylinder with reduction valve and pressure gauge complete. 2 = the volumeter. 3 = the manometer. 4 = the cannula. a = the control valve. b = the calibration valve to regulate the rate of flow of the gas, vide test.

fine bubbling or squeaking noises as it is escaping from the ostia on both sides of the hypogastrium. This sound is quite characteristic and when once heard is readily appreciated for what it is.

If only one tube is patent, the pressure necessary for the passage of the gas is higher and will probably be in the neighbourhood of one hundred to one hundred and twenty millimetres while the stethoscope will detect the sound of gas escaping on one or other side of the hypogastrium.

If both tubes are entirely occluded, the pressure will steadily rise as long as the gas is passed to a limit of safety at about two hundred millimetres.

Finally, the pressure may reach a high figure such as one hundred and eighty and then suddenly drop back to sixty or eighty millimetres. If leakage can be eliminated, this behaviour of the manometer indicates that the obstructing adhesions have been sufficiently light to break down under this pressure.

The dangers of the apparatus are very few and can be easily guarded against. The first is the conveying of septic cervical discharge into the uterine cavity and along the tubes with a risk of setting up peritonitis. It is therefore obvious that every precaution must be taken against this by disinfection of the vagina and the cervical canal with iodine. The second risk is rupture of the tubes which does not occur if the pressure does not exceed two hundred and fifty millimetres or, to be on the safe side, two hundred millimetres. The third possible risk is that, should there be a pyosalpinx with fimbrial walls, it might be ruptured; but this is not likely, since there would be sufficient occlusion of the interstitial or isthmal portion of the tube to prevent the entrance of gas into the pus sac. Every care, however, should be taken to avoid using the instrument if palpable tubal swellings are present.

There are no unpleasant effects except occasionally a little pain in the right shoulder and this depends on the amount of gas introduced. If the amount is not more than one hundred or one hundred and fifty cubic centimetres it is absorbed quickly enough to have disappeared by the time the patient is ready to go home. There will also be discomfort if the pressure rises above one hundred and fifty millimetres in the uterus and tubes as already explained. While it is passing easily there will be little or no discomfort.

Contraindications.

The contraindications to the use of the test are few. They are as follows:

1. Palpable tubal swellings as previously indicated.
2. It should not be used in the presence of obvious cervical discharge without preliminary intracervical treatment for a week or two; nor should it be used after an attack of pelvic inflammation.
3. Because of the congestion present in the tubes it should not be undertaken just before or after a menstrual period. Also the results will be unreliable at these times.

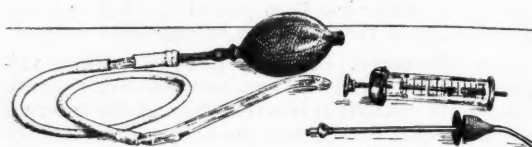


FIGURE IV.

Left = Victor Bonney's apparatus for inflation of the tubes consisting of a rubber bulb and a hollow dilator, size 10. Right = Ten cubic centimetre "Record" syringe and uterine cannula with rubber acorn for the injection of "Lipiodol" in the X ray visualization of the Fallopian tubes.

4. Its use is contraindicated in any serious general disease.

From what I have said it is apparent that in a great number of sterile women one or both tubes will be blocked. Such patients are usually assumed to require simple dilatation and curettage. It is obviously of no value to do this alone if tubal obstruction is the real cause of their sterility.

Accordingly the possibilities should be explained to the patient and either this test performed as a preliminary or while dilatation is being carried out a hollow dilator inserted and the patency of the tubes tested. If they are patent nothing more need be done, but if they are not, some form of plastic operation on the tubes will be necessary.

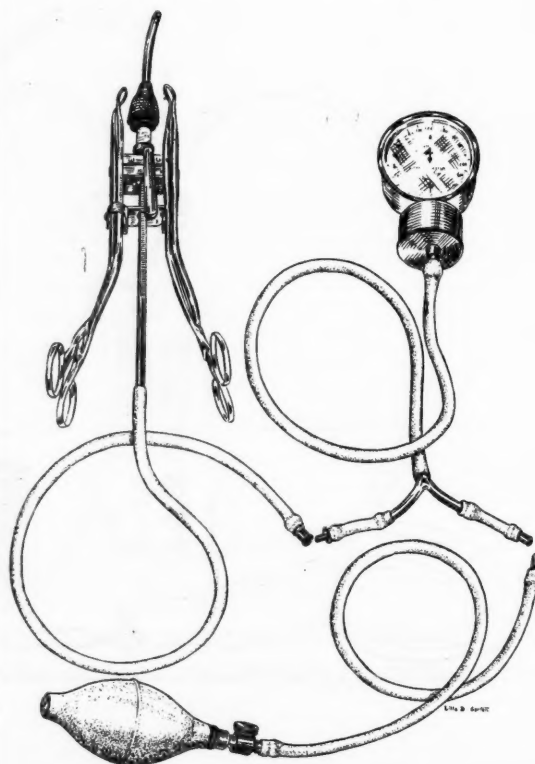


FIGURE V.

This figure illustrates J. Earl Miles's apparatus for the demonstration of the site of occlusion of the Fallopian tubes at laparotomy. The inclusion of the manometer is the author's modification and may be omitted as can be seen by the diagram.

The Modifications of the Apparatus.

A rubber bulb, manipulated by hand and attached to a hollow dilator (Victor Bonney⁽³⁾), without any manometer is used. Bonney claims to be able to estimate the pressure by noting the resistance of the bulb to hand pressure sufficiently accurate for diagnosis (see Figure IV, left).

An apparatus has been devised by Dr. J. Earl Miles,⁽⁴⁾ of Brooklyn, in America. He has made it possible by his ingenious elaboration of the test and the instrument shown in Figure V to test the patency of each tube at laparotomy and thus to enable the surgeon to determine with accuracy how much of the tube is to be removed or what shall be done, as he has pointed out, "at the time that conservative surgery can be applied."

The apparatus consists as you see of two tenacula secured to a metal crosspiece through which a cannula, fitted with a rubber acorn, is inserted. The cannula has a toothed ratchet arm, so that when the cervix is grasped on either side with the tenacula and the cannula inserted, it may be pressed home and retained in position without an assistant. A bulb is attached to the cannula by means of a rubber tube which may be disconnected in the middle to allow of sterilization. Miles does not use a manometer, but I have inserted one in order to compare my results with those obtained before operation by Rubin's technique. The bulb and its

tubing are sterilized by alcohol; the instrument itself is boiled. In practice a nurse holds the manometer and the surgeon compresses the bulb while observing the effect on the Fallopian tubes of the pressure of air. During the short time that I have had the instrument, I have used it in some half dozen cases and am convinced that it is a useful addition to our armamentarium.

A further development of the test has been the injection of "Lipiodol" by syringe and cannula (see Figure IV, right) and the taking of X ray films at the time and twenty-four hours afterwards.

All that is required is a five or ten cubic centimetre "Record" syringe to which is attached a cannula fitted with a rubber acorn. Five cubic

centimetres of the iodized oil are slowly injected with gentle pressure in order to fill the uterine cavity and tubes. If too much pressure is used, the operator is apt to induce spasm of the uterine end of the tubes and thus defeat the object of the procedure, namely, to obtain a salpingogram. In private practice I am accustomed to carry out Rubin's test as demonstrated and then, if I am in doubt, to replace the cannula by a small one and inject the oil. In this way I have obtained the films here shown.

Illustrative Cases.

The first (see Figure VI) is the immediate film obtained in a case of gonorrhœal infection. By Rubin's test I was able to pass gas at a pressure of between one hundred and sixty and one hundred and seventy millimetres of mercury and to diagnose right tubal occlusion. The X ray film showed the left tube filled to its fimbriated extremity. The twenty-four hours film (see Figure VIII) shows that the tubal ostium is patent by virtue of the fact that "Lipiodol" is seen lying free and scattered about in the pelvis.

The case is an exception to the rule in that only one tube is obstructed.

The last film (see Figure IX) demonstrates both tubes blocked at their cornua.

In this case I had done Rubin's test and had failed to get gas to pass. The X ray method was

carried out only for comparison of the two methods.

The drawbacks to the method are its complexity and its cost including as it does an X ray apparatus. However, it shows with certainty the site of the obstruction and seeing is believing to some people.

Prognosis.

If obstruction at the fimbriated end of the tube is diagnosed following appendicitis or puerperal or post-abortion sepsis, the prognosis is good.

In the gonorrhœal group and when there is obstruction at the isthmus or interstitial portion of the tubes, the chances of successful plastic surgery are less hopeful.

Salpingostomy is usually said to be successful in 5% to 7% of cases. But Bethel Solomons,⁽⁵⁾ Master

LEGENDS TO ILLUSTRATIONS OF ARTICLE BY DR. M. GRAHAM SUTTON.

FIGURE VII.—UTERO-SALPINGOGRAM.

This X ray picture was taken immediately on injecting five cubic centimetres of iodized oil into the uterine cavity in a post-gonorrhœal case. A = Fundus of the uterus; the whole cavity is not visualized as some of the oil escaped into the vagina just before the exposure was made. B = Ampullary portion of the left tube. C = Narrow canal of isthmus of left tube. D = Shadow of the volsellum and the cannula with its acorn surrounded by the escaped oil in the vagina. The right tube is not visualized and appears to be sharply cut off at the right cornu, indicating the point of occlusion of the tube. Apart from the history of Neisserian infection and Rubin's test there was no other indication of right tubal pathological damage since the right adnexa could not be felt on pelvic examination.

FIGURE VII.—UTERO-SALPINGOGRAM.

This represents the condition in the same case as is depicted in Figure VI, fifteen minutes later without any more oil being injected. It shows the ampullary portion of the tube, B filled more completely and more plainly visible. The uterine cavity is empty. D = the cannula *et cetera* in the vagina.

FIGURE VIII.—UTERO-SALPINGOGRAM.

This represents the condition in the same case as is depicted in Figures VI and VII twenty-four hours after the injection of iodized oil. The film shows masses of opaque substance scattered irregularly about the pelvic portion of the peritoneal cavity, indicating that the left tube was patent at its abdominal ostium.

FIGURE IX.—UTERO-SALPINGOGRAM.

This figure shows the X ray appearance of the uterine cavity injected with iodized oil in a case of primary sterility following gonorrhœal infection. A = the triangular shadow of the cavity. B = the cannula with its acorn and the volsellum in the vagina. Note none of the oil has escaped. Both tubes are blocked at their uterine extremities, the left a little more distally than the right. Further demonstration of the site of occlusion was made at laparotomy by the use of Miles's instrument as shown in Figure V and double utero-salpingostomy was performed.

of the Rotunda Hospital, claims that thirty-two out of seventy-two patients whose adhesions at the fimbriated ends of the tubes were gently divided became pregnant (44.4%).

In twenty-five cases in which the fimbriated ends had been resected, six patients subsequently conceived (24%).

Out of fifteen cases in which he had done a resection of the diseased portion of the tube and end-to-end anastomosis, one was successful (6.6%).

In twenty-four cases in which he had done a hysterо-salpingostomy, three patients subsequently became pregnant (12.5%).

That is to say out of a total of 136 patients 42 or 30.9% were benefited by plastic surgery on the tubes—nearly one woman in every three! Surely that is worth while!

L. G. Phillips⁽⁶⁾ has also published a series of cases of plastic work on the tubes which was followed by pregnancy in 25% of cases within three years.

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⁽³⁾ V. Bonney, *The Lancet*, November, 1904.

⁽⁴⁾ J. Earl Miles: "Procedure for Determining the Patency of the Fallopian Tubes at Laparotomy," *Surgery, Gynecology and Obstetrics*, July, 1926, page 96.

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KÉRATODERMIE BLENNORRHAGIQUE.¹

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In 1893 Vidal⁽¹⁾ observed and recorded the first case of the remarkably rare and interesting condition known as *kératodermie blennorrhagique*. It was not till seventeen years later in 1910 that Sequeira⁽²⁾ reported the first case in England. Two years later (1912) the first case seen in America was described by Simpson.⁽³⁾ It was in this year also that Swift⁽⁴⁾ observed a case which was the first Australian contribution to the literature of this condition. From an exhaustive examination of indices, records *et cetera* up to the present time it appears that there have been only sixty-five authentic cases of *kératodermie blennorrhagique* recorded in the literature of the world.

In Australia two cases have been recorded, Swift's case mentioned above in 1912 and Lindeman's⁽⁵⁾ in 1922. The present is the third Australian case. Vidal's original description specified a generalized

and symmetrical cutaneous eruption of cornified crusts, hyperkeratosis and disintegration of the nails associated with urethritis and polyarthritides due to systemic invasion of Neisserian diplococci. It was only in a few instances that he observed vesiculation and pustulation to precede the cornification. His patient was bedridden and remarkably emaciated. Since it is only the skin eruption, the keratodermia, which differentiates these cases from the much more numerous instances of gonorrhœa associated with arthritis alone, Graham Little⁽⁶⁾ asks why this skin condition is considered of Neisserian origin.

Although Wadsack⁽⁷⁾ found a Gram-negative diplococcus on microscopical examination of an "efflorescence" and Gager⁽⁸⁾ also states that smears from the pustules on the skin contained extracellular Gram-negative diplococci, absolute proof is lacking in so far as repeated attempts to find the specific coccus in the skin lesions have failed. However, very convincing evidence is found in the effect on the skin eruption of injection of gonococcal vaccines (Woodward,⁽⁹⁾ Willmott,⁽¹⁰⁾ Scholtz⁽¹¹⁾). Further, "metastatic gonorrhœa" implicating various body tissues is now of such common knowledge as to call for no comment.

In regard to the view that the curative effect from a gonococcal vaccine in these cases was due to its specific action and not to a non-specific immunization of the foreign protein, it must be recorded that mixed staphylococcal vaccines have been used and have had no effect. Further, intense focal reactions were observed after the first one cubic centimetre dose.

These injections not only increased the general malaise, fever and arthritic symptoms, but also brought out on other parts of the body skin lesions identical in character with the preexisting ones. Assuming then that systemic gonorrhœa is the sole ætiological factor of *kératodermie blennorrhagique* why is it that males and females and children are not equally affected? A careful perusal of the literature reveals only one case in a female (Isaac⁽¹²⁾) and there is not one single authentic case in a child. Lees⁽¹³⁾ also reported a case in a woman who had arthritic symptoms, but there was no definite evidence that the patient had gonorrhœa. All that can be definitely stated is that the syndrome of *kératodermie blennorrhagique*—urethritis, polyarthritides and hyperkeratosis—may have a common origin which may be Neisser's diplococcus, but whether there is some still further factor remains uncertain.

Distribution of Lesions.

Vidal in his classical description mentions "a generalized and symmetrical cutaneous eruption," but easily the majority of the cases reported have been of the localized type involving the hands, feet or some other part. In the case herein recorded the feet constitute the principal site of the eruption.

Pressure obviously has an important bearing on the production of the keratodermia for the parts of the sole which come in contact with the ground when a man stands erect and barefooted, are the parts most affected. According to tabulated results

¹ Read at the inaugural meeting of the New South Wales Section of the British Association of Dermatology and Syphilology, September 22, 1927.

the soles of the feet come easily first in incidence (thirty-four cases). Next come the toes, thirteen, dorsum of feet twelve, legs below knee ten, penis nine, hands eight *et cetera* (Graham Little).

Differential Diagnosis of the Skin Lesions.

When we remember the constant and practically invariable association and sequence of the syndrome of *kératodermie blennorrhagique*—urethritis, polyarthritis and hyperkeratosis—it would appear that there should be no diagnostic difficulty. But such great men as Adamson⁽¹⁴⁾ and Falk⁽¹⁵⁾ have almost denied the existence of this condition as a clinical entity and are inclined to include it in a group of atypical cases of arthropathic psoriasis. Certainly some few of the lesions have a faint resemblance to those of psoriasis, but a careful and constant watch of their initiation and subsequent development readily refutes any common origin.

Vesicle formation and pustulation play no part in the development of a psoriasis crust, yet these two factors seem fundamental in *kératodermie blennorrhagique*.

Then again this is a toxic, inflammatory condition which runs a febrile course, the arthritis is of an acute and inflammatory nature and is very painful. Arthropathic psoriasis is a chronic condition, there is no toxæmia and the joints give no pain. Clinically, then, there seems no resemblance. In the histological characteristics there is a slight resemblance inasmuch as in each condition a parakeratosis is manifest.

The degree of parakeratosis in *kératodermie blennorrhagique* is very pronounced and supports the claim of Haase⁽¹⁶⁾ and Stillians⁽¹⁷⁾ that the condition should be called *blennorrhagie parakeratosis*.

Some of the lesions resemble the rupia crusts of syphilis, but these are isolated lesions and represent but a cipher in the total excrescences. Again, in few of the cases reported is there a record of a reaction to the Wassermann test and these few reactions may have no connexion with the outbreak of the *kératodermie blennorrhagique* lesions. Further, in Vidal's case and others, notably Keim,⁽¹⁸⁾ antisiphilic treatment gave little or no amelioration.

Another condition, tylosis (palmar and plantar keratoses) may present similar features. It, however, has not the cone-like elevations or the wide distribution of *kératodermie blennorrhagique*. Furthermore, tylosis has no association with gonorrhœa or arthritis.

To sum up, once a case of *kératodermie blennorrhagique* has been seen, it should be extremely easy to recognize another one and the making of a diagnosis should present no difficulty.

Association with Urethritis.

According to Sequeira the urethritis has been a minor feature in all the cases. There was no urethral discharge in Scholtz's case. The patient has usually had several attacks before arthritis and keratosis have been noted. The discharge has

ceased in some cases years before the advent of the keratodermia. Williams cites a case in which the interval of time was thirteen years. The case herein reported represents special interest inasmuch as the patient has a profuse urethral discharge containing gonococci, but admits to an old infection ten years earlier.

Report of Case.

I first saw the patient, W., on August 16, 1927, in consultation with Dr. Stratford Sheldon. His occupation was that of a trade overseer and his age was thirty-six. He was in bed profoundly cachectic and in considerable pain. His temperature was 38.9° C. (102° F.) and his joints, particularly the right ankle joint, were swollen and tender. He admitted coitus on July 26, 1927, and a yellow discharge first appeared at his urethra on August 5. Gonococci were present in this discharge.

His skin lesions first appeared on August 12 simultaneously with the onset of his arthritis.

He admits to a previous Neisserian infection twelve years ago.

The Skin Lesions.

The most prominent lesions were on the plantar aspect of both feet with several on the sides. There were also several areas on the dorsum. They took the form of brownish-yellow cone-shaped horny crusts, mostly discrete but some of them had coalesced, leaving irregular horny masses with nodular surfaces. The early lesions were transparent, looked like vesicles but contained no fluid. There were several pustular-looking lesions. The diameter of the cone-shaped crusts varied from six to eighteen millimetres (one quarter to three quarters of an inch). At the periphery of all the lesions there was a narrow zone of hyperæmia very sharply defined. The appearances are clearly seen in the accompanying illustrations.

The nails of the two small toes of the right foot were almost obliterated by heaped-up horny material.

On scraping off the crusts of some of the lesions, a sticky greyish substance was noted. These areas are now slightly pigmented.

On the penis also there were several areas of horny material.

The Joint Condition.

The first joint affected was the left shoulder joint. From there the pain "moved to the left leg, between the thigh and the knee." The right sterno-clavicular was very tender, the left and right shoulder joints were tender and very stiff. There was tenderness over the area of the eighth to the tenth thoracic vertebrae. The left metatarso-phalangeal and the right ankle were swollen and very painful.

The Genito-Urinary Condition.

Dr. Darby Loudon kindly examined the patient and reported on his genito-urinary condition. He found that when a three glass specimen of urine was examined, the first was white with pus and the second and third were cloudy with pus. Balanitis was present, but there was no epididymitis. The glands in the inguinal region were palpable. The left Cowper gland was slightly enlarged, the right was not palpable. The left side of the prostate was soft, slightly boggy, but not enlarged. The right side of the prostate was soft, but not enlarged. The left seminal vesicle was soft and somewhat enlarged and the right vesicle was soft but not enlarged. Dr. Loudon expressed the opinion that these findings were contrary to expectations. He said that he would have expected to find a large prostate and enlarged vesicles as the focus of absorption of the gonorrhœal virus. He thought that possibly the rest in bed might have resulted in the resolution of inflammatory deposits. He summed up the position by stating that the patient was suffering from a subacute anterior and posterior urethritis of Neisserian origin with accompanying prostatitis, vesiculitis, left Cowperitis and arthritis.

Pathological Investigation.

Dr. C. H. Shearman very kindly consented to do the complement deviation test, the Wassermann test and the histological examination of some of the lesions.

His observations are recorded in full as follows:

A complement deviation test carried out on the patient's blood on September 15, 1927, gave no reaction with a Neisserian antigen. Nor was there any reaction to the Wassermann test.

The complement deviation test was repeated ten days later but again no reaction occurred.

Smears made from the contents of pustules on the foot showed many pus cells but no gonococci or other organisms could be detected.

A lesion which had reached the third or crusting stage was removed for histological examination and showed microscopically the following characteristics: Superficially the lesion was covered with a crust which consisted of imperfectly cornified epithelial cells together with leucocytes. The epithelial cells of this outer covering still retained their nuclei (parakeratosis). There was some hyperplasia of the malpighian layer, the outer epithelial lymph space of which showed in parts a leucocytic infiltration. The basal layer was intact. In the corium the papillae showed inflammatory changes, being oedematous and showing small cell infiltration.

The absence of any reaction with the blood to the complement deviation test in spite of the metastatic infection as evidenced by the arthritis is of interest.

In reviewing the literature on this subject reference could be found to two cases only in which the complement deviation test had been performed. In each of these there was no reaction to the test though one of them also had arthritic complications.

It is possible that the failure of the blood to react to the complement deviation test may not only result from the absence of any immunity response, but further may indicate an anaphylactic state, the patient being hypersensitive to the toxins of the gonococcus. The dermatological lesions may then be a manifestation of this condition.

It is interesting to note in this regard that the histological picture of *keratodermie blennorrhagique* and that of psoriasis are very similar.

Psoriasis is regarded by some authorities as a manifestation of anaphylaxis, the organism being hypersensitive to bacterial toxin produced in the intestinal tract and desensitization of the patient in a certain number of cases has resulted in improvement of the skin lesion.

Treatment.

The patient was instructed to eat as much as possible of a full diet with the reservation that no condiments, spicy foods, asparagus, curry *et cetera* were allowed. Bland fluids were taken to the quantity of a gallon or more daily. Salts were given as a routine three times a week. An alkaline mixture containing citrate of potash, bicarbonate of potash and tincture of hyoscyamus was given after meals three times daily and again at night. After three weeks of more or less "masterly inactivity" as above a series of intramuscular injections of "Contramine" was given, 0.25 gramme, on the advice and with the active cooperation of Dr. Loudon. These were given at four day intervals. After the second injection the patient began to show definite improvement. After four injections his general condition had advanced sufficiently for Dr. Loudon to begin active treatment on his urethra. Irrigations with weak alkaline solutions of permanganate of potash were given to the anterior part of the urethra for eight days after which posterior irrigations were adopted and have been continued since. The patient is still under treatment, but his condition both local and general has improved immeasurably. The skin lesions began to resolve after the second injection of "Contramine" and no fresh ones appeared. At present there are no lesions on the dorsum or lateral aspects and most of those on the plantar surface have peeled off. His arthritis has cleared

up except in the case of the right ankle joint. His urine is clear, containing no shreds. He is putting on weight, walking about and is cheerful.

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Reports of Cases.

FRACTURE OF THE ANTERIOR INFERIOR SPINE OF THE ILIUM.

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In March, 1895, over thirty-two years ago, I made my first contribution to medical literature by reporting a case of fracture of the anterior iliac spine in a boy of seventeen by muscular violence.⁽¹⁾ I have been interested to see this case referred to twice, since then in articles by other writers. To one of these, Dr. Heller, of Kansas City, I had

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already been frequently indebted for various courtesies before he published his own case and sent me a reprint some time ago. It is rather curious that I should now be reporting, as a sort of complement to my first contribution, a case of fracture of the anterior inferior spine. At the time of the first case, Röntgen had not made his great discovery of the X rays. But it was through the Röntgen rays that the nature of the present case was revealed.

E.L.C., aged sixteen, was injured at football on Saturday, June 28, 1924. He felt a sudden severe pain, referred apparently to the site of the anterior superior spine of the ilium on the left side. He had to cease play, but he limped home. On examination, there was great tenderness at the spot, but no crepitus could be distinguished. It was regarded as a sprain, a partial rupture of the attachment of the *sartorius* to the anterior superior spine. He limped off to school on the following Monday and continued to do so every day. The pain and tenderness gradually improved. Six weeks afterwards, he was playing football again. But at this time, being curious to know what had really happened, I sent him to Dr. J. G. Edwards, who X rayed him and reported that he had fractured the anterior inferior spine of the ilium, and that there was a well-marked formation of callus. This bony prominence, it will be remembered, forms the attachment of the tendinous anterior head of the *rectus femoris* muscle.

I have recorded this case for several reasons, the first of which I have mentioned above. To me there is also an added interest in that the patient was my own son. The next reason is that it is probably a very rare injury. And finally, it is of considerable medico-legal interest. I have often wondered how long and how serious would have been the disability in a man entitled to monetary compensation for the injury. Looking at it from that point of view, note again that the patient was playing school football six weeks after receiving the injury. It may be remembered here that the anterior inferior spine does not constitute the whole seat of origin of the *rectus* muscle, and it is likely that the other part of the muscle retained its attachment. The skiagram is reproduced in the accompanying plate.

Reference.

⁽¹⁾ C. E. Corlette: "Fracture of Anterior Superior Iliac Spine by Muscular Violence," *Australasian Medical Gazette*, March 15, 1895, page 99.

FAMILIAL INFANTILE ANÆMIA.¹

By F. GUY GRIFFITHS, M.D. (Sydney).

Honorary Physician, Royal North Shore Hospital, Sydney.

J.H., a girl, aged two years, was admitted to hospital on July 28, 1927, suffering from "jaundice."

Three months previously she had had an attack of "catarrhal jaundice" from which she had recovered. Five other children in the family had had jaundice at that time and they all had recovered.

Inquiry into the family history revealed that five other children in the family were all healthy. The mother and father were healthy. There was no family history suggestive of syphilis. The father stated that all his people had been anæmic at one time or another and that he himself when young had had anæmia and jaundice. He also said that his liver had been enlarged until he was about the age of twenty.

Two weeks before admission the patient had become jaundiced. Four days before admission she had had abdominal pain and vomiting together with swelling of the ankles.

On admission the patient had well marked jaundice. She was anæmic and œdema of the ankles and sacral region

¹ The patient described herein was shown at a meeting of the New South Wales Branch of the British Medical Association on August 11, 1927.

was present. The tongue was furred and grey. There was a grey line in the gums above the upper incisor teeth. The liver dullness was two fingers' breadth below the costal margin, the upper limit of dullness being normal. The spleen was not palpable. The urine contained bile pigments, but no albumin. The response to the Van den Bergh test indicated that the jaundice was hæmolytic in nature. A blood count revealed the following:

Red blood corpuscles, per cubic millimetre	1,000,000
Hæmoglobin value	18%
Colour index	0.9
Leucocytes, per cubic millimetre	40,625
Polymorphonuclear cells	64%
Myelocytes	13%
Lymphocytes	19%
Eosinophile cells	4%

The red blood cells manifested a slight irregularity in size, shape and staining. Many normoblasts and megaloblasts and a few "mother cells" were seen.

While in hospital the patient had an irregular intermittent pyrexia. Her condition since admission has gradually improved. The jaundice has not been so intense. The patient's appetite has improved and her apathy has disappeared. She has been given iron, arsenic and iodine.

On August 9, 1927, a blood count revealed the following information:

Red blood corpuscles, per cubic millimetre	2,580,000
Hæmoglobin value	45%
Colour index	0.8
Leucocytes, per cubic millimetre	8,750
Polymorphonuclear cells	81%
Lymphocytes	17%
Eosinophile cells	2%

An occasional megaloblast was seen. No normoblasts nor myeloblasts were found.

The red cells manifested considerable irregularity in size, shape and staining.

A Wassermann test carried out on August 11, 1927, yielded no reaction.

Comment.

This little patient's case approximated to the von Jaksch's type (*anæmia pseudoleucæmica infantum*) except that she was two years of age instead of twelve months or less and that the spleen was not large.

It may be added that after demonstration her good progress continued, the red cells increasing to 3,750,000 of good size and shape and she was bright and well when discharged on September 13.

Acknowledgement.

I am indebted to Dr. Graham for notes on which this report is based.

LARGE OVARIAN CYST IN A GIRL AGED FIFTEEN YEARS.

By R. I. FURBER, D.S.O., M.B., Ch.M. (Sydney),

Honorary Gynæcologist, South Sydney Women's Hospital,
Honorary Assistant Gynæcologist, Sydney
Hospital, Sydney.

N.S., aged fifteen years and one month, was admitted to the Sydney Hospital on October 8, 1926. She had noticed a progressive enlargement of the abdomen for a year, accompanied by slight dyspnoea. There were no other symptoms and she had never menstruated. Examination revealed very great enlargement of the abdomen with flattening of the umbilicus and resonance could be obtained only over a small area in the flanks and above the xiphisternum. A definite thrill was obtained. An intact hymen necessitated rectal examination and the uterus was found to be small, anteverted and apparently pushed down by the cystic tumour. The diag-

nosis of ovarian cyst was confirmed at operation. An ordinary multilocular pseudomucinous cyst was removed entire through an incision extending from pubes to ensiform cartilage. Dense adhesions between its upper surface and the under surface of the liver and more posteriorly to the transverse colon were encountered. It was very difficult to attack these before delivery of the tumour and delivery of the tumour would probably have caused serious trauma to liver or bowel. However, this was the only real difficulty and the patient made an easy recovery.

The tumour weighed 11.75 kilograms (twenty-one and a quarter pounds), measured 33 by 30 by 22.5 centimetres (thirteen and a quarter by twelve by nine inches) and proved to be non-malignant.

Points of interest in the case are:

1. The size of the tumour in relation to the age of the child, as I can find nothing in the available literature to approach it.

2. The necessity of considering the ovarian origin of abdominal tumours in childhood, whereas Fraser in "Surgery in Childhood" states that the likelihood may be disregarded.

3. Parovarian and papillomatous cysts are never found before puberty (Bland Sutton, "Surgical Diseases of the Ovaries").

4. All authorities agree that the possibility of malignant disease cannot be eliminated and that ovarian tumours should be removed entire.

LARGE OVARIAN TUMOUR IN A GIRL FIFTEEN YEARS OF AGE.

By C. E. CORLETTE, M.D., Ch.M. (Sydney).

Senior Honorary Surgeon to the Sydney Hospital, Lecturer in Clinical Surgery, The University of Sydney.

M.B., a girl of fifteen, was sent into hospital, May 5, 1920, as a case of large liver with ascites. According to the hospital notes, she first noticed swelling in her abdomen about one year before admission. She sometimes felt very breathless, and her friends stated that she had become thinner. Nothing is recorded of the menstrual history.

On admission, she had an enormously distended abdomen. The left side of the abdomen was less resistant to palpation than the right, and in the lower part a tumour was palpable on the right side. The tumour was fairly well defined, and appeared to move with respiration. There appeared to be ascitic fluid in the abdomen. There was no abdominal tenderness. The upper limit of liver dulness was level with the fourth interspace in front and in the axillary line. The liver dulness was not continuous with that of the tumour. The spleen was not palpable. There were no urinary symptoms. The heart presented nothing abnormal.

Though in the light of later knowledge it is clear that ovarian tumour should have been diagnosed at once, or at least strongly suspected, it was thought before operation that it might be a case of tuberculous peritonitis.

On May 19, a median incision was made from pubes to ensiform. Immediately, an enormous ovarian cyst was exposed. It was brought out of the wound, the pedicle clamped and tied and the tumour removed. It sprang from the right ovary. Recovery was uneventful, and she was discharged on June 16.

Reviews.

THE USE OF ULTRA-VIOLET RADIATION.

THE second edition of a book entitled "Ultra-violet Radiation and Actino-therapy," by Dr. Eleanor and Dr. W. Kerr Russell has been received.¹ The first edition was reviewed in these columns only a few months ago (see THE

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MEDICAL JOURNAL OF AUSTRALIA, May 14, 1927). The present edition embodies the experiences of a further year of treatment with these modes and contains considerably more information; it is thus almost twice the size of the former edition. The various lamps now in use are described and an estimation of their advantages and disadvantages is attempted.

Though the authors describe themselves as medical practitioners and not as specialists, their experience is such that they may claim special competence in these modes of therapy and in the ability of tempering enthusiasm for a new modality with the restraint of experience.

The various types of lamps they describe are in general found to be satisfactory; the air cooled mercury vapour lamp being especially satisfactory and useful. Its disadvantage is its fragility and comparatively short life. The tungsten arc lamp gives off more radiation and is cheaper to install but upkeep is costly owing to the high price of tungsten electrodes. It must however be constantly hand regulated as the electrodes wear and it gives off objectionable fumes and sputters considerably.

The carbon arc lamp is very suitable for hospitals where many patients are to be treated together, but it is costly in current. Stress is placed on the necessity of regulating the dosage according to the patient and his lesions and an extended record of the types of condition that are benefited by the treatment is included.

The bogey of the danger of causing malignant changes in the skin by the use of this modality is satisfactorily laid and an interesting chapter on the history of light treatment is included.

The book should be in the hands of all practitioners who contemplate adopting this mode of treatment and although it contains much more technical matter than is required by the general practitioner, we can recommend it to him for its sane outlook on this interesting subject.

CONTROL OF CONCEPTION.

A book on birth control—more properly on the control of conception—has been published under the editorship of Sir James Marchant, the Secretary of the National Birth Rate Commission.¹ It consists of an introduction by Sir Thomas Horder and a series of articles by well known medical men and women who have been wisely chosen and who consider the subject from various points of view, national and psychological, medical, gynaecological *et cetera*. Considerable attention has been paid to the historical aspect and lessons are drawn from the decadence of ancient civilization which may well have a bearing on the possible future of some of the great nations of today. The effects of the widespread practice of conception-prevention on the family, the well being of the child and the general moral tone of the community are considered. Due allowance is made for the cases in which disease in one or another of the parents renders the birth of children inadvisable. While the desirability of preventing the birth of the unfit is acknowledged, the many difficulties in the way of such prevention are given due importance. On the whole the disadvantages of the practice are believed to outweigh any advantages that may be obtained. Evidence is advanced to show that the voluntary postponement of conception tends to sterility; that in most instances the health of the woman suffers if this practice is followed and that the healthiest and happiest families are those consisting of many children.

The book deals with a subject which has been discussed in lay and medical circles; it is written "in a spirit of scientific inquiry" by men and women of acknowledged eminence in the medical profession and should be read with interest and profit by all who are engaged in practice and have the welfare of their patients and the community at heart.

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The Medical Journal of Australia

SATURDAY, NOVEMBER 12, 1927.

The Future Generation.

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wastage can be reduced. The reduction in the mortality of infants under one year of age has been at the rate of 2.8% per annum in England and Wales, at the rate of over 3% in New Zealand and at the rate of approximately 2.5% in Australia. Dr. Vera Scantlebury gives it at 2.25% for Victoria. We have therefore the evidence of greatly improved conditions today. According to Sir George Newman's last report the infantile mortality in England and Wales in the year 1926 was 60 per thousand births. The Commonwealth Statistician gives the figure of 53.4 for the year 1925 for Australia. Dr. A. M. Wilson points to the loss of approximately 30 foetuses in the postnatal period per thousand confinements and of a further 30 infants in the neonatal period in Victoria in 1924. Dr. Marshall Allan has analysed the work conducted under the auspices of the Victorian Bush Nursing Association in the five years from 1922 to 1927. It appears that 2,273 women were confined during this period and that 1,434 or 63% were attended by a medical practitioner either in a bush nursing hospital or in the patient's own home. The remaining 839 women had a nurse to attend them. All the mothers did well. There were twenty-nine stillbirths and twelve neonatal deaths, that is of infants under one month. Had the mortality been the same as the average for Victoria, there would have been 68 stillbirths and 69 deaths of infants under one month. Good obstetrics and obstetrical nursing have therefore saved 96 human beings for the State. This has been possible on a small scale under the ordinary conditions of Australian bush life. It confirms Dr. Jefferis Turner's opinion that, while more research is needed, the practical application of what is already known is a more urgent necessity. It is a terrible indictment of the medical profession in connexion with the appalling loss of human life a quarter of a century ago. A glance at the causes of death will suffice to prevent undue satisfaction with the present achievement. Grouping the stillbirths and the neonatal deaths together, it is found that fifteen of the forty-one deaths are ascribed to prematurity, six to birth injury and two to congenital malformations. No details were available concerning fourteen deaths. Dr. Wilson's figures reveal that about 40% of neonatal deaths

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wastage can be reduced. The reduction in the mortality of infants under one year of age has been at the rate of 2·8% per annum in England and Wales, at the rate of over 3% in New Zealand and at the rate of approximately 2·5% in Australia. Dr. Vera Scantlebury gives it at 2·25% for Victoria. We have therefore the evidence of greatly improved conditions today. According to Sir George Newman's last report the infantile mortality in England and Wales in the year 1926 was 60 per thousand births. The Commonwealth Statistician gives the figure of 53·4 for the year 1925 for Australia. Dr. A. M. Wilson points to the loss of approximately 30 foetuses in the postnatal period per thousand confinements and of a further 30 infants in the neonatal period in Victoria in 1924. Dr. Marshall Allan has analysed the work conducted under the auspices of the Victorian Bush Nursing Association in the five years from 1922 to 1927. It appears that 2,273 women were confined during this period and that 1,434 or 63% were attended by a medical practitioner either in a bush nursing hospital or in the patient's own home. The remaining 839 women had a nurse to attend them. All the mothers did well. There were twenty-nine stillbirths and twelve neonatal deaths, that is of infants under one month. Had the mortality been the same as the average for Victoria, there would have been 68 stillbirths and 69 deaths of infants under one month. Good obstetrics and obstetrical nursing have therefore saved 96 human beings for the State. This has been possible on a small scale under the ordinary conditions of Australian bush life. It confirms Dr. Jefferis Turner's opinion that, while more research is needed, the practical application of what is already known is a more urgent necessity. It is a terrible indictment of the medical profession in connexion with the appalling loss of human life a quarter of a century ago. A glance at the causes of death will suffice to prevent undue satisfaction with the present achievement. Grouping the stillbirths and the neonatal deaths together, it is found that fifteen of the forty-one deaths are ascribed to prematurity, six to birth injury and two to congenital malformations. No details were available concerning fourteen deaths. Dr. Wilson's figures reveal that about 40% of neonatal deaths

are due to prematurity. With still greater antenatal supervision and care, this occurrence should be reduced in frequency and in consequence fewer babies should be exposed to the risk of death from this cause. The same may be said of birth injuries. The machine is capable of improvement if the causes of death are unknown in over 34%. It must be assumed that some, at all events, of the fourteen deaths were the result of remediable causes. There is no information concerning the deaths of infants between the ages of one month and twelve months. Moreover, the wastage due to abortion and miscarriage is not included.

The problem is not completely covered by a statement of the loss of life. The objective that the medical profession should set itself to attain, is to influence every embryo to become in due time a healthy citizen. The combating of pathological processes in the mother, the avoidance of complications of parturition, the wise feeding of the baby by Nature's method, the proper handling of infants and young children should result in a material advance toward the realization of this objective. When the whole medical profession accepts as its main duty the application of the principles of preventive medicine, this splendid work begun by such institutions as the Victorian Bush Nursing Association will embrace the whole community. In the meantime the bush nurses and the doctors associated with them will more nearly reach the ideal.

Current Comment.

MELANIN PIGMENTATION.

IN February, 1926, the subject of the melanomata was discussed in these columns in the light of work by Smith, Darier and Dawson. It will be remembered that the question at issue was the place of origin of melanotic tumours, whether they are of epithelial origin or whether they arise from mesenchymal cells. But little was written about the origin of melanin pigment or its distribution in the normal individual. It is obvious that if the relationship of melanin to the cells of the body were understood, particularly in regard to its distribution and increase, a distinct advance would be made in the problem of malignant disease. Much work has been done on the subject of melanin pigment occurring normally in the body, but more remains to be accomplished. Several views have been advanced to explain the origin of melanin. The oldest is that

it is derived from blood pigment. It has also been regarded as the product of secretory activity of the nucleus or nucleolus. The later and more generally accepted view is that it is the result of cell metabolism, that the protein in the cell is converted into melanin by means of an enzyme. Spencer believes that the formation of melanin is preceded by a colourless substance, melanogen, and that the latter is converted by oxidation into a coloured melanin. Bloch holds that the formation of melanin is the result of interaction within the cell of an enzyme, an oxydase, such as causes vegetable and animal matter to change colour and a mother substance brought to the cell. According to this view it is the enzyme which is specific to the pigment-producing cell. Thus it is assumed that in albinism the enzyme is absent and no pigment is formed from the colourless mother substance. A cell which produces melanin is known as a melanoblast and a cell containing pigment not elaborated by itself, but obtained elsewhere, is known as a melanophore or a chromatophore.

S. William Becker has recently carried out an investigation at Bloch's *Dermatologische Klinik* into the pigment of the human skin and mucous membranes.¹ He has also paid particular attention to the dendritic cells. By the term dendritic he means a pigment-containing cell with branch-like processes. The material studied was taken from fifty-three unselected autopsies and the parts of the body chosen included the nipple, abdomen, axilla, toe (ball of great toe), inner surface of cheek, pharynx, œsophagus and breast. Specimens were examined unstained, stained with pyronin-methyl green, hæmatoxylin, silver nitrate and after treatment by the method used for Bloch's "Dopa" reaction. Pigment was found in 100% of specimens from the nipple, abdomen, axilla, external surface of the male prepuce; in 96% of sections from the internal surface of the prepuce; in 81% of sections from the toe; in 74% of sections from the buccal mucosa and in 21% of sections from the pharynx. Becker points out that it has hitherto been believed that the normal oral mucous membrane does not contain pigment, but that the discovery by him of pigment in 74% of cases demonstrates a normal pigmentation for this region. On the other hand it was concluded that pigmentation of the pharynx is always pathological. It was found in all cases of generalized malignant disease studied, but not in localized carcinoma. Most of the bodies with pigmentation of the pharynx presented slight generalized hyperpigmentation with the exception of the oral mucosa. Becker experienced considerable difficulty in the recognition of dendritic cells. When they were well filled with dark melanin and not surrounded by much pigment, they could readily be seen in unstained sections. Otherwise the silver method was necessary and in two instances typical dendritic cells with extensive branching could be demonstrated only by means of the "Dopa" reaction. This was explained by the presence of "Dopa"-oxydase and the absence of melanin or of melanin which gives the silver reaction. On the other hand a fully pigmented cell may no longer possess "Dopa-

¹ *Archives of Dermatology and Syphilology*, September, 1927.

oxydase and consequently may react with silver and will not react with "Dopa." The "Dopa" reaction is not well suited to the study of autopsy material unless the material can be obtained shortly after death. For this reason Becker thinks that the percentage of dendritic cells is possibly smaller than that which would have been obtained had the material been removed *ante mortem*. Dendritic cells were found in 79% of sections from the internal surface of the prepuce, in 67% of sections from the toe, in 50% of those from the axilla, in 44% of those from the external surface of the male prepuce, in 25% of those from the nipple and abdomen, in 21% of those from the pharynx and in 7% of those from the buccal mucosa.

Such are the main morphological findings described by Becker. In considering them there arise several questions such as the nature of the dendritic cell and the significance of increase in pigment. There are three main views as to the nature of the dendritic cell. According to the first every epidermal basal cell is dendritic, but only a few are identified as such by their contained pigment. According to the second the non-dendritic cell changes to a dendritic cell on functional stimulation. Those who hold the third view believe that dendritic and non-dendritic cells represent genetically distinct types. It should be noted in passing that Becker states that Bloch accepts the second of these possibilities as the most probable. The observed facts concerning megaloblasts and melanophores are more readily reconciled with the view that the dendritic and non-dendritic cells represent genetically different types of cell than with any other hypothesis. The latter are mesoblastic cells which have engulfed pigment lying free in the connective tissues. The former belong to the same type as the naevus cell which was traced by Dawson from its origin in the *rete Malpighii*. He holds that these cells lose their intercellular fibrils, become detached and actively proliferate and assume a spindle or star shaped form and finally break through the transition zone between epidermis and corium to settle in the upper part of the corium. Becker refers to cells of the Mongolian spot and blue naevus and describes "melanoblasts of mesodermal origin." His reason for regarding them as melanoblasts is that they have given the "Dopa" reaction. The melanophores, the cells in the corium which have ingested pigment, do not give this reaction. It will be remembered that Dawson refers to a statement of Bloch that if a cell gives the "Dopa" reaction, it is related to the epidermis. If this is true, then Becker's melanoblasts in the corium are not of mesodermal but of ectodermal origin. Becker states that it is impossible to reach a definite conclusion regarding the nature of the dendritic cell. The fact that the "Dopa" reaction often reveals dendritic cells when they cannot be found by other methods, leads him to believe that all basal cells are possibly dendritic. This would agree with Dawson's view of the origin of the naevus cell. Becker also describes the presence of so-called transitional forms and refers to the "transition theory." This presumably refers to the desmoplastic hypothesis put forward by

Kromayer which was discussed in the article on melanomata previously mentioned and which was described as striking a blow at the accepted view of the specificity of the germinal layers of the embryo. In spite of the evidence in favour of the "transition theory" he is struck by the resemblance of some of the dendritic cells to cells of the central nervous system. Soldan has advanced the view that the dendritic cells are related in origin to the cells of the central nervous system and Masson has supported the view. It must be remembered that the central nervous system is of ectodermal origin.

When the question of the significance of the increase in pigment is considered, some interesting facts are revealed. Becker examined specimens of tissue taken from patients with acanthotic lesions and from patients suffering from Addison's disease. It is impossible to describe the findings in detail, but they may be summed up in the statement that in lesions of the former type there was an increase in the pigment of the dendritic cells and in the latter the increase was in the non-dendritic type, in other words in the melanoblasts and melanophores respectively. Becker has shown that melanin is present in the skin and mucous membranes to a greater extent than has previously been supposed. It is also known that various forms of irritation may bring about an increase in pigmentation. His findings in regard to Addison's disease and acanthotic tumours make it possible to weave an hypothesis according to which the type and degree of pigment production will depend on the nature and intensity of the stimulus, a stimulus in the calling forth of which the nervous system or the adrenal gland may or may not play a part. In its most intense form the stimulus would result in an overgrowth of the epidermal cells which produce the pigment. In a form not so intense it would result in the overproduction of pigment which would be taken up by the melanophores in the corium. This is an important field for continued investigation and in view of the curious manifestations of melanin in the animal kingdom, comparative pathology, though it has been useful in the past in this connexion, will probably be the means of further accession to knowledge.

SUBSCRIPTION TO THE MEDICAL JOURNAL OF AUSTRALIA.

THROUGH the kindness and courtesy of the Council of the New Zealand Branch of The British Medical Association arrangements have been made whereby the members of that Branch can subscribe to THE MEDICAL JOURNAL OF AUSTRALIA at greatly reduced rates. The ordinary subscription to the journal is two pounds a year. The Branches of The British Medical Association in Australia pay for the journal supplied to their members at a special rate. The same rate will be accepted from members of the New Zealand Branch provided that the orders are placed with the Secretary of the Branch before or about the beginning of the year and the sum of twenty-five shillings is added to the amount remitted as subscription to the Branch.

Abstracts from Current Medical Literature.

PHYSIOLOGY.

Diastolic Size of the Heart During and After Exercise.

F. D. MCCREA (*American Journal of Physiology*, July, 1927) has studied the effect of exercise on the diastolic size of the heart. Teleskiagrams were taken during as well as before and after moderate and severe exercise on a bicycle with a prony brake. The results show that the effects of moderate exercise for ten minutes on the heart is variable and is characterized by little or no change in diastolic size. After exercise the heart was the same size or slightly smaller. All subjects during ten minutes of severe exercise showed evidences of slight increase in area, though here again the volume changes were small. A slight decrease was noted in every case save one after exercise was over. The data seems to show a relationship between venous pressure, pulse rate and cardiac volume. With high pulse rate the tendency is for venous pressures to rise less high and for cardiac volume not to increase. With slower pulse rates there is usually associated a higher venous pressure and an increase in diastolic size.

Effect of Posture on Circulatory Minute Volumes in Women.

It has been noted that quiet standing for a considerable time is frequently accompanied by signs of circulatory embarrassment or distress even in healthy individuals. It seemed highly probable that this postural change might yield interesting results when studied from the standpoint of the minute output of the heart and A. H. Turner (*American Journal of Physiology*, May, 1927) has determined the minute volumes of healthy young women in reclining, sitting and standing positions. The Field-Bock method was used; twenty-five healthy young women were examined. While the metabolism showed a small rise on sitting as compared with reclining and a larger rise on standing, the minute volumes changed in the opposite direction, a fall averaging 10.9% on sitting and 21.1% on standing. The average values in litres for the three positions were reclining, 6.26 litres; sitting, 5.59 litres; standing, 4.77 litres. The difference between the carbon dioxide content of the arterial and venous blood became greater as standing was continued, a change associated with a fall in the carbon dioxide of the alveolar air too regular and too progressive to be due to overventilation. The heart rate was increased in sitting as compared with reclining and further increased on standing. The output per beat was thus decreased on sitting as compared with reclining and much more decreased on standing. The changes observed in pressure relations are in harmony with the explanation that the return of blood to the heart is

lessened during quiet standing. This is largely overcome by making small voluntary muscular movements while standing. The systolic blood pressure often falls on standing, a fall which might naturally follow a diminished return of blood. The mean pressure of the erect position is, however, maintained at a level approximating to that of the reclining position by a rise in diastolic pressure.

Viscosity of Blood in Shock.

R. A. WAUD (*American Journal of Physiology*, June, 1927) has studied the changes in the viscosity of the blood in shock and the relation of these to the fall in blood pressure. Anaphylactic, peptone and histamine shock have been studied and no great differences have been demonstrated in the mechanism of the fall of pressure in the different types. The theory is advanced and supported by evidence that the fall in blood pressure is brought about by a sudden transitory reduction in the viscosity of the blood. Immediately following the injection of peptone there was in nineteen animals a reduction of from 14.4% to 4.4% in the viscosity of the blood. The reduction in viscosity causes a fall in blood pressure because of the fact that the less viscid blood passes through the small arteries and arterioles more readily and thus the pressure and blood volume in the capillaries are suddenly increased. A reduction in the viscosity of the limiting membrane of the endothelial cells of the capillaries is mentioned as a probable contributing factor in the production of oedema in shock. The increased pressure in the capillaries would no doubt be a factor in the passage of fluids out of the circulation.

Oesophageal Pain.

THE discovery that the retrosternal pain commonly called "heartburn" was associated with activity of the oesophagus has led W. W. Payne and E. P. Poulton (*Journal of Physiology*, August, 1927) to study the relation of pain to various activities of the oesophagus. To record the movement of the oesophagus and to bring about stretching of its walls they used rubber balloons of about fifty cubic centimetres capacity into which air, never in sufficient amount to distend the rubber walls, was placed. These balloons, attached to a rubber tube and manometer, were passed to different distances down the oesophagus. When a certain amount of air was introduced into the balloon the stretching of the oesophageal wall caused a series of peristaltic contractions to pass down the oesophagus at first without any sensation. As the amount of air was increased, pain began to appear and when the oesophageal wall was stretched sufficiently, the pain was continuous with exacerbations related to peristaltic contractions of the oesophageal wall. From the experimental results it is suggested that visceral pain is caused by stretching and deformity of pain endings in the walls. It is relieved by a peristaltic contraction that over-

comes the stretch or by postural adaptation which increases the capacity of the viscus. It is made worse by a peristaltic contraction which is unable to overcome the stretch, and which is consequently held up in its course. The latter causes "painful spasm." "Burning" pain results from a continuous stretching and deformity of pain endings. When relieved periodically by successive peristaltic waves, it becomes "gripping" in character. Pain is especially apt to occur during the muscular relaxation that follows a peristaltic wave.

Seasonal Periodicity in Man.

F. R. GRIFFITH, G. W. PUCHER, K. A. BROWNELL, M. E. CARMER and J. D. KLEIN (*American Journal of Physiology*, July, 1927) have studied the seasonal periodicity of the basal metabolism, cardiovascular condition, blood gas capacity and cell count in two normal men for two years and three normal women for one year. Oxygen consumption follows a very regular curve which is lowest late in the summer. Carbon dioxide production varies within wider limits than oxygen and fails to show a definite seasonal rhythm. The respiratory quotient is highest in the summer. The energy expenditure, calculated as calories per square metre per hour, is lowest in summer. Respiratory rate is greatest in summer, associated with a definite shortening of the expiratory phase. The minute volume is lowest in late spring and highest in the fall. The tidal volume is lowest in the early parts of the year. Alveolar air shows no seasonal change, but was related to menstrual cycle; the carbon dioxide was lowest just before and highest midway between the periods. The basal pulse rate follows a regular curve which is lowest in summer. Systolic blood pressure is lowest in the spring. Blood gas capacity (for both oxygen and carbon dioxide) was highest in the spring and fall and lowest in the winter. Blood counts reveal that the number of erythrocytes is highest in the summer and that of the white cells highest in the spring.

Response to Respiratory Resistance.

THAT resistance to respiration has a profound effect on the respiration has been known for some time, but the effects of resistance in the inspiratory phase and the expiratory phase respectively have not been studied in detail. R. L. Moore and C. A. L. Binger (*Journal of Experimental Medicine*, June, 1927) have studied these effects in animals where the experiments could be allowed to go to their natural conclusion. Resistance to inspiration results in a fall in intratracheal pressure which is associated with an increase in respiratory rate and a decrease in tidal air. In most instances these are accompanied by a severe limitation of the minute volume of pulmonary ventilation. Anoxæmia accompanies these changes, but may be prevented by the inhalation of 90% to 95% oxygen. Associated with the anoxæmia there is a

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retention of carbon dioxide and usually a drop in pH. When resistance is removed the respiratory rate continues to be rapid. Release, however, permits an increase in tidal air and minute volume and as a result of this there is a fall in carbon dioxide concentration, a rise in pH and in some cases a complete disappearance of the anoxæmia. *Post mortem* congestion and oedema of the lungs are found. Resistance to expiration slows the respiratory rate and limits the minute volume of pulmonary ventilation. These changes may or may not be accompanied by a retention of carbon dioxide and a low oxygen saturation of the arterial blood. With removal of resistance all functions return to their normal or approximately normal levels. No direct evidence was obtained of the liability of fatigue of the respiratory centre.

BIOLOGICAL CHEMISTRY.

The Action of Ammonium Salts.

M. WHELAN, M. F. JACOBS and N. M. KEITH (*American Journal of Physiology*, July, 1927) have shown that following the administration of ammonium salts and their absorption into the blood stream some of the ammonia is quickly synthesized to urea. The liberated acid ion increases the anion content of the blood and tissues and causes certain changes in metabolism. The administration of ammonium salts thus offers a means of studying the action of different acid ions. Ammonium chloride, ammonium nitrate, ammonium sulphate, ammonium benzoate and ammonium acetate have been administered to dogs and their effect on certain blood and urine constituents noted. No toxic effects were noted from the amounts given. The inorganic acids, benzoic acid and their ammonium salts, produce an acidosis in the tissues, while acetic acid has no demonstrable effect on the acid-base equilibrium. The nitrate ion appears to have the invariable effect of increasing the urinary output of water and chlorine.

Nitrogen Metabolism in Experimental Subacute Arsenic and Antimony Poisoning.

E. PRIEYL (*The Journal of Biological Chemistry*, September, 1927) has induced experimental subacute poisoning in four rabbits by sodium arsenite and in four rabbits by antimony potassium tartrate and has followed the changes in ratio between urea nitrogen and non-protein nitrogen in blood and between urea and ammonia nitrogen and total nitrogen in urine. He has found that there is an increase in non-protein nitrogen in blood after administration of both poisons. In arsenic poisoning the increase is more apparent. In arsenic poisoning there is a rise of non-protein nitrogen due to rise of urea nitrogen. The urea nitrogen quotient rises with the rise of urea nitrogen. The rise of non-protein nitrogen and urea nitrogen in blood is associated with an increase

of these constituents in the urine. The ammonia nitrogen quotient in the urine of poisoned rabbits seems to be inversely proportional to the urea nitrogen quotient.

Friedländer's Bacillus.

W. F. GOEBEL (*The Journal of Biological Chemistry*, September, 1927) finds that the soluble specific substance of Type A Friedländer's bacillus yields on hydrolysis an aldobionic acid, glucose and a second unidentified sugar acid. These compounds occur approximately in equal proportions. The author has made a detailed chemical study of the new aldobionic acid and finds that it consists of a molecule of glucuronic acid linked through its reducing group to a molecule of glucose. It is isomeric with an acid derived similarly from the soluble specific substance of Type 3 pneumococcus.

Sugar Metabolism after Adrenalectomy.

C. F. CORI and G. T. CORI (*The Journal of Biological Chemistry*, September, 1927) have found that when rats, surviving double adrenalectomy, were subjected to a twenty-four hour fast, the liver glycogen disappeared and the blood sugar fell considerably below normal. In contrast to the liver glycogen the glycogen content of the muscles of these animals remained the same as that of normal control rats which were made to fast for the same length of time. The low blood sugar is linked with the lack of liver glycogen, since the muscle glycogen does not participate in sugar regulation. The absence of liver glycogen in fasting rats which have been subjected to removal of the adrenal gland, is not the result of a disturbance in the synthesis of sugar into glycogen, since liver glycogen is formed at a normal rate when glucose is fed. Rats whose adrenal glands have been removed and which have fasted for twenty-four hours, absorb glucose at a much slower rate than normal rats which have been fasting for a similar period of time. The authors found that during four hours of glucose absorption the rats whose adrenal glands had been removed, oxidized without "Insulin" three hundred and seventy-three milligrammes of glucose and formed two hundred and seventy milligrammes of glycogen. Of the latter one hundred and twenty-four milligrammes were formed in the liver and one hundred and forty-six milligrammes in the rest of the body. Rats whose adrenal glands had been removed and which received "Insulin" injections, oxidized four hundred and seventy-one milligrammes of glucose and deposited thirty-seven milligrammes of glycogen in the liver and one hundred and eighty-five milligrammes of glycogen in the rest of the body. The difference in liver glycogen of eighty-seven milligrammes corresponds closely to the difference in glucose oxidation of ninety-eight milligrammes, while the glycogen deposition in the rest of the body is not materially changed. The same

results have been obtained previously on rats with intact adrenals, but in these experiments it has been impossible to exclude a discharge of epinephrine in sufficient amounts to produce a metabolic effect. Since the adrenals were absent in the experiments carried out by the authors, they have formed a conclusion that the lessened deposition of liver glycogen and the increased sugar oxidation, also to be observed in rats receiving "Insulin" with intact adrenals, are due to "Insulin" alone and not to a combined action of "Insulin" and epinephrine.

Glycolysis in Leucæmic Blood.

H. L. SCHMITZ and E. C. GLOVER (*The Journal of Biological Chemistry*, September, 1927) find that the rate of glycolysis in normal blood, as determined by the study of ten normal individuals, varies approximately between fifteen and twenty-three milligrammes per hundred cubic centimetres of blood per hour. The initial concentration of glucose within a range of from sixty to two hundred and fifty milligrammes per hundred cubic centimetres does not affect the rate of glycolysis in normal or leucæmic blood. In chronic myelogenous leucæmia the rate of blood glycolysis is more rapid than normal except in an aleucocytic stage. It may be as rapid as eighty-four milligrammes per hundred cubic centimetres per hour. The number of white blood cells and the rate of glycolysis tend to run parallel. The degree of immaturity of the white blood cells and the rate of glycolysis also tend to run parallel. In chronic lymphatic leucæmia the rate of blood glycolysis is seldom more rapid than normal. But when the lymphocytes are very immature, the rate may be slightly rapid. Potassium cyanide in a one-thousandth normal concentration causes a definite increase in the rate of blood glycolysis in myelogenous leucæmia. It causes a less pronounced increase in the rate of glycolysis in lymphatic leucæmic blood and has very little effect upon the rate in normal blood.

Vitamin A and Greenness in Plants.

MARIE DYE, OLIN C. MEDLOCK and JOHN W. CRIST (*Journal of Biological Chemistry*, July, 1927) have investigated the relative Vitamin A content of head and leaf lettuce. As a result of their experiments on rats they conclude that leaf lettuce exceeds head lettuce in the promotion of growth in rats that had ceased to gain on a diet deficient in Vitamin A. The outside green leaves of head lettuce were far superior to the inside yellow in furnishing Vitamin A. Indoor leaf lettuce in the author's hands proved as beneficial as outdoor leaf lettuce in promoting growth. Although the authors have not been able to prove the certain identity of chlorophyll or any of its primary phases with Vitamin A, they found evidence which in their opinion points towards the probability of some close relationship between the two.

British Medical Association News.

SCIENTIFIC.

A MEETING OF THE NEW SOUTH WALES BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at the Mental Hospital, Gladesville, on October 13, 1927. The meeting took the form of a series of demonstrations by the members of the staff.

Manic Depressive Psychosis.

DR. A. T. EDWARDS showed a series of patients who were suffering from manic depressive psychosis.

A woman, aged fifty-eight years, was married and had five children. She had been an inmate of the hospital on four previous occasions, in 1914, 1916, 1919 and 1923. The physical history of the patient had been clear on admission. In the family history there was to be noted a discrepancy of eleven years in the ages of the parents and a brother was an inmate of another mental hospital suffering from manic depressive psychosis. The patient was the youngest of eleven, her twin brother had died at the age of four from an unknown cause. She had always been a strong healthy child, as a scholar she had been above the average and had been popular at school. After leaving school she had been a school teacher until her marriage at the age of twenty-six. Her married life had been fraught with much worry and anxiety, her husband being a heavy drinker and an unfortunate gambler. She had often experienced much trouble in keeping up appearances on account of his financial losses. The first attack, a manic phase, had occurred when the patient was twenty-one years of age and had followed the discovery that a man of whom she was very fond, was already married. The patient, however, refused to attach any causative significance to this.

Another patient, a woman, aged fifty-eight years, was married and had three children. She had been born in Victoria. After a healthy childhood she had passed her matriculation examination well. She had been a teacher for some years, but even then had been "of a highly strung disposition." She had married at the age of twenty-nine, her husband being three years her senior and of the same religion. She stated that her married life had always been happy and that there had been no domestic nor financial worries. Her eldest child was twenty-five years of age and the youngest seventeen. She had always been healthy with no illnesses apart from a "curettage" after the last confinement. Six months prior to admission she had suffered from a severe attack of influenza and her symptoms had appeared during convalescence. She had manifested delusions of persecution and hallucinations of sight and had spent six months in a private hospital before admission. On admission she had been depressed and excessively agitated. She had had visual hallucinations of her children being burned and auditory hallucinations which told her that her children were to be hanged by the head. She had had a delusion that a gang of hypnotists were going to assault her children and visual hallucinations of lights floating on the water together with auditory hallucinations of "dreadful music." She brought these forward as proofs that she and her children were to be destroyed.

Another patient, a man aged forty, was married and had eight children. His brachial arteries were sclerosed, but no other physical abnormality of note was discovered. The family history was clear. He had been born in Queensland. The eldest in the family, he had been a good scholar, but had left school at thirteen years of age and since then had been doing various kinds of work in the bush. He had been married happily for twenty-three years. He had had eleven children, three of whom were premature and still born. He had a farm of one hundred and forty-two acres which was mortgaged; he had put a great deal of work into this and it had caused him a great deal of financial worry.

He had been healthy during his life with the exception of influenza in 1919 and dengue a few months before admission. He denied excessive potus, but admitted

frequent masturbation, both as a youth and lately in order to limit his quickly increasing family.

For two months before the melancholic phase he had been in a mild state of euphoria, saying that he never felt better in his life and worked excessively hard. Dr. Edwards said that this was probably a phase of hypomania. He had then become listless and depressed, unable to work and had entered the local hospital, where he contracted dengue, previously mentioned. Becoming more and more delusional, he had been certified as insane four months after the onset of the melancholic phase.

On admission he had been agitated, lachrymose and restless, but conversed readily, displaying correct orientation and a good memory. There had been an intense degree of depression, associated with extreme hypochondriasis. The patient had the following delusions: (i) That his bowels had ceased working for three months; (ii) that the doctor stopped every nerve in his body; (iii) that the doctors swore he was insane to punish him; (iv) that he was a sexual maniac; (v) that he had had no sleep for three months; (vi) that a lingering painful death was awaiting him; (vii) that he had "lost his nerve of identity."

A married man, aged fifty-seven years, had four children. He had been admitted to mental hospitals on four previous occasions, in 1905, 1915, 1921 and 1924. Nothing of note had been found on physical examination at the time of admission.

The family was free from hereditary disease or diatheses. The patient had been born at Wagga. He had been a healthy boy, but a moderate scholar and had left school at the age of fifteen. Thence he had spent three years as a jackeroo, followed by prospecting in Western Australia and then he had obtained a position as overseer on a station in Queensland. He married in 1900. In 1905 he had been admitted to the Mental Hospital, Kenmore, in a condition of delusional melancholia, hallucinated and suicidal. It was stated that previously to this he had been restless and excited and would obtain money from his wife by threatening to shoot her. Since then he had had many occupations of a labouring type, including office cleaner and pamphlet distributor. The last twenty years of his domestic life had been most stormy.

On admission in 1927 he had been childishly grandiose, asserting that he was "at the top of his profession." Then and since he had been euphoric and restless, emotionally labile and inconsequent in action. He performed small every-day acts with every care as to the correct customs and legal phraseology.

A single man, aged fifty years, had been admitted to hospital on several previous occasions. The only physical abnormality discovered on admission had been *pyorrhea alveolaris*.

The family history was clear with the exception of one sister who was "nervous." The patient was second in a family of seven. A moderate scholar, at the age of fourteen he had begun work on his father's farm and remained there until twenty-one years of age, when he began general farming work of the higher grades. He had had an attack, apparently of acute mania, in 1897 and had been in Gladesville Mental Hospital for eleven months. A healthy man, he had never married, was a heavy smoker and moderate drinker. All his life he had been engaged on farm work, contracting, fencing, *et cetera*. The next attack had not occurred until he was forty-four years of age, when a simple melancholic phase had developed. At the age of forty-seven he had had an attack of acute mania and had again been admitted to Gladesville Mental Hospital. This had cleared up within a week and a month later he had been discharged. A month later he had been readmitted in a maniacal phase, but within a fortnight had become normal. A month later while he was working at the Mental Hospital, Orange, another transient attack of mania of a week's duration had occurred. He had been discharged in April, 1925. Four months later he had developed a mild phase of simple melancholia which lasted until his admission in June, 1926. He had been depressed and hypochondriacal. He was intensely interested in his

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excretory functions and had a delusion that his bowels were inactive.

It was pointed out that there appeared to be a "seasonal incidence" in this case—every attack had begun between July and September, a not uncommon phenomenon.

A married man, aged twenty-nine years, had been admitted to hospital on three previous occasions, in 1906, and twice in 1912. No physical abnormality had been discovered at the time of admission.

A family history manifested a psychopathic tendency, the mother and a maternal aunt being psychotic.

The second in his family, he had enjoyed good physical health up to the time of his first attack. At school he had been but a moderate scholar, but had manifested no seclusive tendencies. Leaving school at thirteen years of age, he had begun work as a farmer. He had married at twenty-one years of age and had had three children before his second admission to hospital and one child between his third and fourth admissions. No evidence of psychic conflict could be obtained. His first admission, like all those succeeding, had been for acute mania. In the acute stage when out of hospital he was violently homicidal.

Another patient was a married man, aged sixty-two years. He had had a soft systolic murmur at the time of admission and hæmorrhoids which had recurred after operation two years previously. His systolic blood pressure had been 105 and his diastolic pressure 70 millimetres of mercury. He had suffered from dengue at the age of forty-two and there was no history of alcoholism.

The family history was clear. He had been a healthy child and a good scholar, leaving school at sixteen years of age when he entered his father's business; his father was a tea merchant. At the age of twenty-two he had gone to England and there had entered the Baptist ministry. He had married at twenty-seven years of age, having two children, one had died at the age of seven of diabetes. He had had a "nervous breakdown" at the age of forty-four, when he was depressed, sleepless and suffered from many gastro-intestinal symptoms. About this time he had joined another church, desiring more freedom. Also about this time he had begun *coitus inter femora* with his wife, which he continued until eighteen months before admission. This had happened almost nightly and had constituted his one enjoyment in life. He had finally become impotent and had worried greatly over this. He had become sleepless and depressed and had lost interest in everything.

On admission he had been correctly orientated, with good memory. His affect had been one of mild depression, associated with emotional inertia for anything but his own symptoms. He was exclusively hypochondriacal. All his interest was directed towards his excretory function. He had a delusion that he passed a minute amount of faeces, despite ocular evidence to the contrary.

Alzheimer's Disease.

Dr. S. J. MINOGUE showed a patient who was suffering from Alzheimer's disease. This case will be reported in a subsequent issue.

Paranoia.

Dr. A. L. KINNA showed several patients who suffered from paranoia. The first patient was fifty-three years of age. He had an intelligence quotient of 80, a "dull normal." He had been born in Sydney and his father who was a confirmed drunkard had died at the age of thirty-five from tuberculosis. His mother who had remarried had died at the age of seventy-two from some dropsical complaint. He had one sister and one brother alive and well. The former was younger and the latter older than himself. There was no history of mental disease. The psychological mechanism concerned was one of projection.

The patient had been five and a half years of age when his mother remarried and his step-father after some months had become abnormally cruel to the family; he had often returned home intoxicated and brutally assaulted mother and children. The patient had commenced school at the age of seven years and had liked it very much. Returning from school one afternoon he had found his

step-father assaulting his mother in a brutal manner, having broken her nose and caused other injuries. The step-father had soon turned upon the patient, beaten him cruelly and turned him out on the street. The lad had roamed the streets, sleeping in empty houses and begging food from anyone at all. He had later been arrested for stealing boots to cover his bare feet. This crime had resulted in his transference to the ship *Vernon*, where he remained for three and a half years, when he was apprenticed to a farmer who thrashed him and made his life most unhappy. He had escaped from this farm and returned to Sydney, where he again roamed the streets, joined with bad associates, was convicted of stealing and transferred to the *Vernon*. After some months he had been apprenticed to a baker in the country, who was kind to him and taught him the trade.

After returning to Sydney he had worked at his trade for some months and had been treated at Royal Prince Alfred Hospital for an attack of nephritis, but had subsequently been discharged benefited. Henceforth he had had periodical attacks of the disease (according to himself) which made it very difficult indeed for him to gain employment; consequently he had lapsed again into his criminal pursuits and had been continually convicted and incarcerated. During his last sentence his delusions had become manifest and he had been transferred to the care of a mental hospital.

He believed that while he was in gaol he was persecuted by comptroller, warders and prisoners, all of whom formed a conspiracy to ill-treat him.

He thought that the patients in the mental hospital made indecent overtures to him and by signs tortured him; one patient smacked his lips, which indicated that he was the Devil incarnate. The nursing staff all combined in an effort to ill-treat him. They put drugs in his food, winked and coughed to irritate him and put handkerchiefs over their faces to make little of him. They said he was a "live dead man" and an "animated corpse" and selected him always as the subject of torture. The medical officers controlled his mind and made him confused. They affected his stomach by drugs so that he had a most uncomfortable feeling. They stopped his heart when they wished to, they made him deaf, blind and gave him a choking sensation in his throat. They controlled his defæcation and micturition, locking his bowel, once for as long as thirty-two days and only letting him urinate at infrequent intervals. They caused him to have artificial erections and had also contorted his liver and knotted his intestines.

The patient was well orientated, his memory was good, he showed an abnormal keenness of the perceptive faculty and this excess of perception was determined by a prevailing emotional tone of suspicion. His conduct was influenced by his delusions. His essential characteristic was a disorder of judgment, consequent lack of insight into his mental condition and on his ill-balanced temperament and disordered perception was erected a coherent system of delusions. Physical examination revealed no abnormality.

Another patient was a woman, aged forty-seven years. She was the fourth in a family of ten girls and there was no ascertainable history of mental disease in the family.

The patient had commenced school at the age of seven years and had got on moderately well. She had left school at the age of fourteen and had later been employed in various drapery establishments in Sydney. She had married at the age of twenty-three years and was the mother of five children. She had had four miscarriages. Her symptoms had apparently commenced eight years previously after the birth of her last child. This child had been so influenced by her mother's delusions that she herself believed many of these persecutory ideas to be facts. Her married life had not been very happy; her husband was very inconsiderate, had stinted her in her housekeeping money and had not given her a proper home; he swore a great deal and generally ill-treated her. He had intentionally left her in charge of their business and had sent people to worry her; he had often drawn comparisons between his mother and the patient. She stated that for some years some persons whom she did not know, had been "putting it on her children" to

thwart her. The children were coached by these people to disobey and worry her and they even refused to do their home lessons in order to belittle her. The men on the boats and trains continually watched her and pointed the pipes at her to examine her eyes and "threw off" at her. Her relatives accused her of not feeding her children.

Dr. Kinna pointed out that this patient was very reticent, yet she was very delusional. The psychological mechanism concerned was one of projection. She could converse quite rationally and her memory and orientation were unimpaired. Her prevailing emotional tone combined jealousy and suspicion. Her essential character was disorder of judgement with consequent lack of insight into her mental condition. She had systematized delusions of persecution and illustrated the fact that cases of paranoia did not tend towards pronounced dementia. Dr. Kinna also described findings on physical and laboratory examination. The patient had thickened arteries and a systolic blood pressure of two hundred millimetres of mercury.

Another patient was a woman, aged forty-eight years who had been born in New Zealand. She had two brothers alive and well. One brother had had a nervous breakdown; one sister was alive and well; one nephew was definitely insane. Her school life had been uneventful. Her adolescence had been marked by solitariness and patient had made few friends. She had done domestic work at home until she was married. She had had eight children. One child was a seven months baby and one had been born with spastic paralysis. Her husband stated that he had met patient in 1898 and had commenced courtship almost immediately. Shortly afterwards she had complained to him of ill-treatment by her father; for instance, she maintained that her father and mother had accused her of misconduct and had made inquiries reflecting on her moral character among the neighbours. The result had been complete estrangement between parents and daughter. The husband then questioned the parents who said that their daughter was a little headstrong, but quite all right. The husband had believed the patient and had felt very resentful towards her parents, so much so that all friendship and communication ceased. They had been married soon afterwards in New Zealand and shortly after the husband had found that he had become the object of imaginary grievances and gradually his wife's strange ideas had become more manifest. Later she had complained that her husband had taken her from a loving home, had caused altercation between her parents and herself and in fact was the cause of all her unhappiness. She made accusations of neglect, ill-treatment and gambling against her husband, not only directly but indirectly through relatives.

The family had come to Australia and had resided in Brisbane. For some time the patient had settled down, but soon her delusions had gained increased force and she had begun to neglect her home to make accusations against her husband and to develop personal and political grievances which necessitated her removal to Goodna Mental Hospital.

The family had come to New South Wales a few months later and had resided at Newcastle, bringing their mother with them, as she had improved somewhat in her mental health. She had then begun to circulate the old ideas about the husband wrecking her parents' home and dragging her away from happiness. She had written numerous times to the Newcastle paper complaining that the Gas Company used a magnet to read her gas meter, grossly overcharging her. She also wrote vague paragraphs concerning her husband. When the husband had had to seek medical treatment in Sydney for some physical trouble the patient had written to him saying that the neighbours were trying to poison her wine which she had suddenly begun to imbibe to excess. Her delusions had become worse in degree and on the husband's return to Newcastle life had been unbearable, so much so that they had decided to separate, the children electing to go with the father. The patient's mental condition had become very much worse and she had finally been ordered to the Reception House.

Dr. Kinna said that this patient had been twenty-nine years developing her delusional scheme. The psychological

mechanism was one of projection. Her memory and orientation were unimpaired, there was no deterioration of the perceptive faculty, rather an abnormal keenness determined by suspicion.

Her conduct was influenced by her delusions. Her essential characteristic was a disorder of judgement, with consequent lack of insight and her delusions were well systematized.

Another patient was a man, aged eighty years, the son of a surveyor. He had been born in England. His intelligence quotient was that of an average adult. There was no history of mental disease in the family. He had come to Australia when nineteen years of age and had applied himself to various vocations, mostly labouring work. He had been admitted to a mental hospital in 1907, with definite delusions of persecution and grandiose ideas. These had apparently commenced contemporaneously. He had said that he was of royal blood, owned £1,000,000, that his income was £40,000 per year, that he was a prince of the Realm and a cousin of King George. He had also maintained that he was persecuted by people who were endeavouring to wrest his possessions from him and deprive him of his titles.

Dr. Kinna pointed out that the patient still had the same ideas, only much more systematized and had written voluminous reports on his detention and persecution. The ordinary sequence of suspicion, persecutory delusions and grandiose state in this type of paranoia had not been adhered to, for research into the case showed that his delusions of persecution and grandeur apparently commenced contemporaneously. The patient had been resident in mental hospitals for some twenty years, yet he knew the day, month, year and could carry on a coherent conversation. His memory and orientation were quite good. His essential characteristics were disorder of judgement and the reaction of a systematized framework of delusions, of persecution, intimately concerned with which were his delusions of grandeur. Despite his advanced age he was meticulous regarding his personal appearance and needed very little supervision. The degree of dementia manifested was small and might be easily attributed to his advanced age and its accompaniments.

General Paralysis with Korsakoff's Psychosis.

DR. H. H. NOWLAND showed a male patient aged fifty-nine years, who had been sent from Long Bay Gaol to the Reception House. He had been arrested for alleged drunkenness. On admission he had been very confused and disorientated. His memory had been very faulty for past and recent events. He had had numbers of pseudo-remembrances which could be suggested to him, resembling the mental state of Korsakoff's syndrome. His judgement had been faulty. He had said that the two black eyes which were then in evidence, had been obtained two years previously. He had had no insight whatever into his condition. He denied having contracted venereal disease. The patient's tongue was tremulous and his speech was slurring. Rombergism was present. He had Argyll-Robertson pupils. His knee jerks were exaggerated. He had not changed, he had remained euphoric. He had delusions of great wealth. He was very suggestible and his memory falsifications continued. The serum reacted to the Wassermann test. The cerebrospinal fluid also reacted to this test, the number of cells was nine, a reaction was obtained to the globulin test and to the Boltz test and the curve from the colloidal gold test was 5555555433.

The Malarial Treatment of General Paralysis.

In addition to patients from Gladesville Mental Hospital there were shown several patients from Callan Park and Parramatta Mental Hospitals who had been treated by inoculation with malarial parasites for general paralysis of the insane. The preliminary examination, preliminary treatment and method of inoculation were described and details of some of the results obtained were given.

Of sixteen patients treated at Callan Park one had been discharged recovered and he was earning money outside. Four had manifested definite improvement; they had increased in weight, had become useful, clearer mentally and less ataxic. Five had manifested slight improvement both

physically and mentally and two had manifested no improvement to date, but it was too early to judge. In four no improvement was expected.

At the Parramatta Mental Hospital thirteen patients had been treated. Improvement in serological reactions and mental symptoms had occurred in three patients, improvement in mental symptoms alone had occurred in five and the mortality had been nil. It had been found that by careful watching of the patient's condition and by a thorough physical and biochemical examination prior to inoculation fatal results could be avoided.

Several patients were shown.

One patient was a married man, aged fifty-three years, a manufacturer, whose father had died of tuberculosis. One brother suffered from tuberculosis and one was an epileptic.

He had been smart at school. He had worked as a manufacturer and had been in a fair way of business. In 1913 he had suffered from severe gastritis. He had married twelve months prior to admission and had legitimized a daughter aged twelve. He admitted having had gonorrhoea, but denied syphilis. He had done no work for twelve months before admission.

On admission he had been talkative, euphoric and interfering. He had been distractible, wandering constantly from his subject and most of his statements had been obviously unreliable, evidence of memory falsifications. He had accused his wife of numerous persecutions. He had grandiose ideas about his ability to float companies with capitals of £250,000 to start boot polish factories.

He had had slight Rombergism. His pupils had been contracted, equal, the left irregular in outline. They had reacted to accommodation, but not to light. The blood serum had reacted to the Wassermann test and the cerebrospinal fluid which was under increased pressure, had also reacted to this test. The cells had numbered twenty-one. The globulin test had yielded a reaction and the curve obtained by the colloidal gold test had been 5544433211.

He had remained restless and euphoric. He had been given thirteen injections of "Muthanol" biweekly and then mercurial inunctions and mercury by mouth.

On June 21, 1927, he had been inoculated with malaria. Immediately afterwards he had become very disturbed and restless and had had vivid auditory and visual hallucinations. These symptoms had soon subsided and he had manifested a decided improvement. There was not such a pronounced tremor of tongue and facial muscles. His general physical state was much better, though the Argyll-Robertson pupil and Rombergism persisted.

At the time of demonstration the patient's cerebrospinal fluid yielded no reaction to the Wassermann test, no cells were found on examination, the globulin test yielded no reaction and the curve obtained by the colloidal gold test was 1000000000. It was held that the patient must be regarded as cured.

The next patient shown was suffering from the congenital form of general paralysis. He was a boy, aged sixteen years. He had been a messenger boy.

The patient's father was alive, he had had syphilis before marriage and had been treated. A paternal aunt had been in a mental hospital twice. There had been one still-born and one premature child before the patient's birth.

The patient had been a healthy baby, not backward in any way. He had been at school between the ages of six and fourteen and had been smart at his work. He had passed the examination for his qualifying certificate at eleven and had been *dux* of his school. As a child he had suffered from whooping cough and measles. He had been two years at a high school and then at a commercial college for six months. He had had a couple of jobs and apparently had done his work satisfactorily until about twelve months prior to admission.

The first abnormality noticed had been his forgetfulness, especially as regards his dress; he would put on odd socks. He had lost interest in going to picture shows, of which he had formerly been very fond. He had become bad tempered, though he had always been inclined somewhat that way. He would tear up his handkerchiefs or shirts or rip up his pockets.

He had always been of a quiet and reserved nature but lately had become more so. About eight months before

admission it had been noticed that his speech became "drawing." He had then seemed to lose all idea of how to do things. He had had "no action" and had lost interest in everything and had become stooped in walking.

During the year prior to admission he had had vomiting attacks at odd intervals of about one month. In the last attack he had vomited every day of the week. During the previous eighteen months he had had ideas that he was more capable than he really was.

On admission he had been dull mentally with poor ideation content. He had been simple, fatuous, facile and well satisfied with himself. He was 161.25 centimetres (five feet four and a half inches) in height and weighed 48.15 kilograms (one hundred and seven pounds). He had had a drawing speech with fine tremor of the tongue and facial muscles. The pupils had been large, had reacted to accommodation, but not to light. The serum had yielded a reaction to the Wassermann test. Examination of the cerebrospinal fluid had yielded the following results: Reaction to the Wassermann test; reaction to the Boltz test; number of cells, 12; reaction to the globulin test; curve from the colloidal gold test, 5555443221.

He had been inoculated from another patient with benign tertian malaria and after having had ten rigors had been given quinine bisulphate.

It could not be said that there was much change in his condition since treatment. If anything he was not so shaky and tremulous.

At the time of demonstration the cerebrospinal fluid yielded no reaction to the Wassermann test, to the Boltz test or to the paraffin colloidal test, no cells had been discovered and the curve for the colloidal gold test was 3211000000.

A male patient, J.B.H., aged thirty-nine years, a coal miner, had been admitted to hospital in an inaccessible condition. He had refused to answer questions, had been depressed in appearance and often violent and resistive. He had been entirely lacking in insight into his mental condition. He had been in an acutely maniacal condition, necessitating hydrotherapeutic measures. It had been impossible on account of his acute condition and his reticence to determine the presence or absence of delusions or hallucinations. Physical examination had revealed no abnormality in other systems. The knee jerks had not been elicited. The reaction of the pupils to light had been sluggish. Both the blood and the cerebrospinal fluid had reacted to the Wassermann test, a reaction had been obtained to the globulin test, cells had numbered fifteen. The curve obtained by the colloidal test had been 4333222100. After inoculation the patient had become quiet, well behaved and more pleasant in manner. He would converse rationally. His powers of judgement and reasoning were good, his attention was good, his orientation was poor. He knew the year, but not the day. His memory was poor and he was delusional, believing that his sister and two brothers were in a mental hospital. His knee jerks were present. His pupils were large, they reacted to accommodation, but only sluggishly to light. He manifested slight unsteadiness when his eyes were shut. A reaction was obtained to the Wassermann test with the blood, but not with the cerebrospinal fluid, a slight reaction was obtained to the globulin test, the cells numbered two and the curve obtained from the gold test was 3333210000. It was pointed out that this was a considerable improvement on the patient's previous condition.

A male patient, D.E.G., a labourer, before inoculation had been conscious, with moderately good attention. He had been cheerful and garrulous and somewhat unsteady on his feet. He had had exalted ideas of his own ability as a money maker. His emotional tone had been one of exaltation and gaiety and his emotional reaction had been excessive. He had laughed continuously without reason. He had obeyed orders readily and had understood what was said to him, but he had lacked the ability to initiate and maintain a coherent and connected conversation. His attention had been easy to obtain, but difficult to hold and he had failed entirely to realize his situation. He had had no idea where he was and had treated everything as a joke, lacking all sense of proportion. His

powers of judgement and reasoning had been faulty and he had been entirely lacking in insight into his mental condition. All systems had been clear. There had been no alteration in his reflexes. The pupils had been small and had reacted to light and accommodation. Both the blood and the cerebro-spinal fluid had yielded a reaction to the Wassermann test, the cells had numbered eighteen, a reaction had been obtained to the globulin test and the curve from the gold test had been 5555444333. Inoculation with malarial parasites had been carried out and the patient still lacked insight into his mental condition and denied that he had ever had anything wrong with him. His ideas were less exalted than formerly, but he still claimed to own a motor car and a race horse. He said that he had no money, though previously he had claimed to have £10,000 in the bank. His memory was good and his orientation good. His emotional tone was quieter. He was less euphoric and cheerful and considerably more rational in conversation than prior to inoculation. His state was one of quiet euphoria and slight exaltation. There was some slight slowing of speech and some hesitation.

It was pointed out that the patient manifested some improvement. His serological reactions had not been determined. His delusions of grandeur and exaltation were less pronounced and he was a good and industrious worker. This patient and the previous one, J.B.H., presented an interesting contrast in representing two different types of general paralysis. The previous one, J.B.H., represented the acutely maniacal type which later became depressed, responding to treatment so far as to become quiet and more reliable and the second patient represented the exalted euphoric type which also quietened down after inoculation.

A male patient, aged thirty-eight years, represented the same type as the preceding patient. After inoculation this patient's serological reactions had not manifested any pronounced change, but his mental symptoms were considerably improved. He was a reliable, good working patient, gave no trouble in the wards and expressed regret for any trouble previously caused.

Dementia Præcox.

A series of patients, suffering from *dementia præcox*, was shown by Dr. H. H. Nowland. All stages of the condition were represented. Dr. Nowland recounted the histories of several as follows:

A male patient, aged twenty-one, single, a carpenter, was suffering from the catatonic type. He had been admitted on August 5, 1927. His father was alive, he was quiet and rarely spoke. His mother was alive and was mentally unsound.

The patient was the youngest of a family of three. He had been a good baby, had had no illnesses and had been at school till fourteen, he had been an average scholar. He had had few boy friends and did not mix with girls at all. He had been a "home boy," petted by his mother and had spent most of his time reading comic papers *et cetera*. On leaving school he had been apprenticed to a plasterer. At about fifteen he had taken a strange turn. He had said that God had told him to put his head in a fire. He had been in hospital four days. He had started carpentering and had been in three shops during three and a half years.

He had come to Australia with his family three years previously. About three months after his arrival here he had seemed to have a "nervous breakdown" and had been bad for a month, though as a matter of fact he had not seemed well since being out here; he had not been able to keep his jobs. His mother had been ill and this had worried him. He had always thought more of his mother than of his father; he had been "spoiled" by her and he had always been of a "feminine nature." He had liked picture shows and recently had gone to one with his brother who lost him in the crowd. He had not been heard of for some time until he was taken to the Reception House. He had been wandering about the country and had been arrested.

On admission he had been confused, with no idea of time, place or person. He had been very restless and noisy. His conversation had been incoherent, as also were his shouts. No phrase had been without some

obscene word which he had emitted with great gusto, words appertaining to sexuality apparently being the most satisfactory. He had been completely inaccessible, had resented physical examination and had endeavoured especially to conceal his genitals, though he had made attempts to seize those of his fellow-patients.

He had been in a poor physical condition, of a feminine type and he had remained practically the same. He was restless, noisy and elated. He shouted incoherently. There was a flight of ideas, but there seemed to be a diminution of the ideational field and his mirth did not seem at one with his obvious mental content. He rarely answered a question, when he did he was irrelevant and incoherent.

A male patient, aged twenty-one, single, an electrician, had been admitted on July 21, 1927. His father was alive and healthy, aged forty-nine and facile. His mother was alive, aged fifty-four, "highly strung and nervy" and a diabetic. She had been married twice. He had two brothers, one aged seventeen and a seven-months baby who was an imbecile.

Of the children from the mother's first marriage four were alive, eleven had died in infancy. Her first husband had died of pleurisy. Eight or nine years had elapsed before her remarriage.

The patient had been a full time baby. It had been a difficult instrumental birth. He had been a very good baby. He had developed normally and had walked and talked at the usual ages. He had been at school from six till fourteen. He had been an average scholar and had been apprenticed in the electrical trade and was within one week of completing apprenticeship when he "broke down" about four weeks before admission with some inflammatory condition of the eye after having a boil on the neck.

Until lately he had had good health. He had always been "petted" by his mother and in front of people to his embarrassment. He had slept in the same room as his step-sister in younger years and again during the last few years since she had obtained a divorce. He had recently felt sexually inclined towards her. He stated that both of his parents had been too lenient with him, they had given him his own way, but he said that he used to have rows with his mother at about eighteen or nineteen but could not tell the reason why. She had often swooned as a result. His parents had often quarrelled over religious matters. The father, he said, had joined the Theosophical Society. Evidently there had been a lot of family talk about spiritualism *et cetera*.

He had worked hard at his trade and on returning home would "rush" his tea and go to bed or go out with girls. Though he was fond of girls, he told his mother that he would never get married as he would stay at home and look after her.

At about seventeen he had commenced sexual intercourse and continued with the same girl for about three years, he had practised *coitus interruptus*. He had become very despondent. He wanted his mother to meet the girl and eventually she had done so and evidently she did not like the girl or the girl's family. He had not met her again. He had then gone out with another girl for six months; he had had no sexual relations with her; she had put him in mind of his mother. Masturbation which was fairly frequent, had given him more satisfaction than *coitus interruptus*.

He said that he had celebrated his twenty-first birthday on July 13. He had had a party at his house, there had been no girls there. The mother had not liked him going with girls; she told him often that she wished that he had been a girl and he said that there must be more of a girl than boy in him as he would not have these stupid crying fits. At the party there had been a little wine. He had been excited during the previous week in expectation of the party and had had a few drinks. He had been drunk on a few occasions. He had got drunk more quickly than his companions.

On admission he had been restless and agitated with some little insight into his condition. He had been confused, garrulous and distractible. He had been suspicious, accusing the examiner of tricking and jokes. He had appeared to identify himself with his mother,

saying that he had similar feelings to hers and endeavoured to correlate his symptoms with her (swooning *et cetera*).

There had been little change in him, he had remained restless and unsettled. He was generally depressed, sighed deeply, yet on occasions laughed foolishly for no reason. He was disjointed in his ideas and remarks. He said that he experienced a sort of surge all over him, had experienced it first in July. It had felt then as if something had gone blank in his mind. He had some dissociation of personality; he said that he got himself mixed up with another patient. This patient was suffering from *dementia præcox*. He said that he thought a good deal about hypnotism. He tried to hypnotize people, but got "tangled up." This was evidently a mechanism to try to combat his feeling of inferiority as he said that he knew that greater minds controlled baser ones; so he said that he tried to show that his mind was strong enough though he felt that it was not. He had ideas of reference, he said that different people were "putting it over him." He said that he seemed to be influenced by the other patients and could not resist imitating their actions. He said that at meal times he could not breathe, as his mother influenced him and he pictured her face. He said that often when by himself he heard strange voices he did not recognize, telling him to behave himself. He constantly heard the voice of the girl who reminded him of his mother; he heard her singing and said that he would like to marry her.

Often at night he had had fearful visions, until recently they had been pleasant to him and were mostly concerned with naked women.

There was no physical disorder. The ears were slightly asymmetrical. Few palmar markings were present and the thumb was turned forward. The extremities manifested acrocyanosis.

A male patient, aged twenty-two, single, a bootmaker, had been admitted on February 23, 1927. His father had died of cancer when the patient was six years of age. He had been a warehouseman. The mother was alive, a dipsomaniac, somewhat demented. The patient was an only child. He had been born in Sydney, the birth had been normal. He had had measles at eight and had been at school from six to fourteen. He had been a poor scholar and said that he did not get on well at school on account of bad health, he always had a cold. At the father's death the mother had been in straitened circumstances; they had both occupied the same bed room until he was sixteen.

On leaving school he had had odd messenger's jobs, at about seventeen he had been apprenticed to the boot trade and had been with one firm for four years and had worked since for another employer for about twelve months until about a week before admission.

At about sixteen he had been more or less adopted by a single young lady who had lived next door and he had remained in her home ever since, somewhat against the mother's wishes. As a matter of fact there was considerable ill feeling between the mother and this lady over the patient, though it must be said that the mother appeared incapable. He had paid for his board. He had had a number of quarrels with this lady. He had never had any mates, had been most retiring and had always gone out by himself. He had not liked females. He had never gone to any social function. He denied masturbation, but said that he had had excessive nocturnal emissions. When he changed his employer twelve months prior to admission he had been depressed and unable to work, after a holiday he had been better.

He said that since his twenty-first birthday he had been influenced by some sort of electricity, he could not say by what or how, but had been subjected to noises in the head. He had been able often to hear things said to him when alone, generally nasty things, "poking it" at him; he had been called "police pup." He did not know what that meant; he had had lots of things "rubbed into" him. Then he had had ideas that he was being poisoned. He had become very restless and agitated, had been rambling in speech and had made an attempt at suicide.

On admission he had been restless and talkative, flippant and irrelevant. He had refused to give any account of himself or to discuss his affairs in any way. He had con-

tinued mischievous and interfering and had begun to complain about some machine which made him unduly talkative. He had continued troublesome with no insight into his condition. Later he had become much quieter, but had seemed simple and had been emotionally unstable.

He had stiff straight hair and an expressionless face. His teeth were cramped and irregular. His pupils were dilated. His tonsils were hypertrophied. The thyroid gland was palpable. The left testicle was rudimentary. He had small hands with few palmar markings.

At the time of the meeting he was emotionally dull. He had no ideation content and had no plans or ambitions for the future. He denied the presence of hallucinations, no delusions were elicited. He was in fact in a condition of mild dementia.

A male patient, aged twenty-eight, single, a telegraph operator, had been admitted on July 12, 1927. His father had left home when the patient was very young. His maternal uncles were alcoholic. He was the seventh child in a family of nine. He had been at school until fourteen and had been a good scholar. He had gone into the Postal Department, first as a messenger and had progressed to the position of operator. He had always been seclusive and had no friends.

About five months before admission he had begun to be peculiar. He had thought that other members of the family were going to do him harm, to dope him and so on. He had seemed to think this way as he was sleepy at work in the day and could not sleep at night. It would seem that just previous to this he had had intercourse with a married woman and he had been in great fear of her husband. He had left his home and had gone to board, visiting home occasionally. He had then got ideas that someone was after him and he had gone off to the country. He had been arrested by the police because he was acting strangely. He had been under treatment in several places before admission to Gladsville Mental Hospital.

He had then been apathetic, with no interest in his environment. He had been surly and suspicious. It had been difficult to retain his attention. He had been hypochondriacal and had had auditory hallucinations.

He had not changed to any extent.

He had a silly fatuous expression, he "hedged" questions. He rambled in speech in an inconsequent, irrelevant manner. He had defective emotional reaction, laughed in a foolish manner. His ideas were quite disorderly. Memory was defective; he continually contradicted himself.

He evidently assumed the position of husband to the woman mentioned above. He said that he had been married eight or nine months previously (untrue), but forgot to whom or by whom. He said that he wanted to get away as his wife must be in bad health, she must be pregnant. He said that she had sent a message by his mother to say that she was in "good health and having comfort" (also untrue). He said that he must get away, as he "must have the necessity of nature"; he said that it was always impossible for him to get on without it.

Frequently he took no notice of questions, talked to himself and evidently to someone unseen. He was suspicious, self-centred and introspective. There was nothing special to note physically.

Progressive Lenticular Degeneration.

Dr. S. J. MINOGUE showed a single woman, aged twenty-one years, who was suffering from progressive lenticular degeneration. Inquiry into the patient's family history revealed the fact that she had a brother who had had epileptic fits and trembling attacks since he was sixteen years of age. He was twenty-six years of age and the fits persisted. He had done very little work since the age of twenty-one. From the mother's account he did not seem to display the same signs as the patient. A sister was healthy and had two normal infants. No other cases of epilepsy or nervous trouble were known in the family.

Inquiry into the patient's previous history had revealed that she had been normal, but rather a "dunce" at school up to the age of eleven and a half years, when she had begun to have fits—convulsive movements in which she bit her tongue and passed urine. The fits had continued

for three years. The menarche had been when the patient was thirteen years of age and from fourteen to sixteen years of age she had been free from fits. They had recurred at irregular intervals up till eight months previously and since that time she had been free. About three years previously she had found difficulty in walking and for two years had been quite helpless and unable to get about by herself. About a year previously she had begun to have jerky movements of the arms and legs and had become unable to dress or feed herself. The whites of the eyes had occasionally been tinged with yellow during the previous year. There was no history of "influenza" or of double vision. She had been admitted to Broughton Hall on August 29, 1927.

It was pointed out that the patient was poorly nourished. Her cardiac and respiratory systems were normal. The liver dulness was decreased about 3.75 centimetres (one and a half inches). The result of the lævulose tolerance test was normal. Hearing, taste and smell were normal. Ocular movements were normal. The tongue protruded in the middle line. There was no paralysis of the plate. Paresis of the face was present. The patient had a fixed expression with a tendency to a spastic smile. Coarse, spasmodic, irregular movements of the tongue were present. Speech was rather staccato, syllabic, no scanning or lalling was present. Speech was interrupted by spasmodic inspirations. Rough tests of the field of vision indicated some diminution. No nystagmus was present. The discs were pale, but the pallor was within normal limits. There was no disturbance of the sensory system. The patient could discriminate correctly coarse and fine sensation. No loss of muscle or joint sense was present. The pupils reacted to light and accommodation; the range of movement was small; after contraction there was dilatation and tendency to hippus. The knee jerks were brisk and equal. Ankle jerks were present. The elbow and wrist jerks were rather diminished. The abdominal reflexes were active and the plantar reflex was flexor in type.

No trophic changes were present in the muscles. When the patient held out her hands with outstretched fingers, there was hyperextension at the wrist and at the metacarpophalangeal joints. When the patient was at rest, fine tremors were noticed in individual muscles in various parts of the body, also of the muscle groups. Tremors were interrupted by mild coarse contractions of the whole limb. Also coarse, sudden, jerky, spasmodic, non-purposive movements of varying range accompanied movements both voluntary and passive. The movements were violent flexions and extensions spreading throughout the body. The patient found it impossible to put her two forefingers together; the movement was prevented by gross jerky movements of the whole arms and hands. The difficulty seemed to be in coming to rest, for she put her hands over her head readily and joined them together. Voluntary movements of the hands were accompanied by coarse movements and tremors of the trunk and legs and *vice versa*. She was quite unable to perform any fine movement such as writing. The serum had not reacted to the Wassermann test.

Pathological Specimens.

DR. OLIVER LATHAM gave a demonstration of the findings in the colloidal gold test. He also showed a brain in which unusual changes had been found at *post mortem* examination. These changes will be described in full in a subsequent issue.

Occupational Therapy.

A demonstration was made of raffia work carried out by patients in the wards. It was pointed out that patients who were destructive, could be taught to make baskets. The work gave them something to do and not only was frequently of assistance in treatment, but was economically sound.

Post-Graduate Work.

THE NOVEMBER COURSE IN MELBOURNE.

THE Melbourne Permanent Committee for Post-Graduate Work has issued the following syllabus for the course

about to be held. The fee for the course is three guineas, payable at the time of application or before the commencement of the course. Practitioners intending to take part, have been requested to send in their applications on the prescribed forms as early as possible, but not later than October 31, 1927.

SYLLABUS.

Monday, November 7, 1927.

- 9.30 to 11 a.m.—Registration at the Walter and Eliza Hall Institute, Melbourne Hospital.
- 11.15 a.m.—Dr. S. O. Cowen: "Migraine," at the Melbourne Hospital.
- Mr. W. G. D. Upjohn: "Ununited Fractures," at the Melbourne Hospital.
- 2.15 p.m.—Dr. N. H. Fairley: "Snakebite and Snake Venom."
- 3.15 p.m.—Dr. C. H. Kellaway: "Experimental Anaphylactic Shock, Anaphylactic Experiment with Smooth Muscle, Ultra-Filtration for the Concentration of Dilute Protein Solutions, in Hydatid Disease."
- 4 p.m.—J. H. Holden: "Method of Testing for Minute Amounts of Protein."
- Dr. N. H. Fairley, Dr. K. D. Fairley and Miss F. Williams: "New Controls in the Casoni Reaction, Complement Fixation, Precipitin Reaction, for Hydatid Disease."
- Dr. R. J. Wright-Smith: "The Pathology of the Thyroid Gland."
- Dr. L. Bryce: "Isolation of Streptococci in Puerperal Affections."
- Miss B. Splatt: "Biochemical Methods in Common Use."
- Dr. T. Cherry: "Experimental Neoplasms."
- Miss C. Maudsley: "Routine Basal Metabolic Rate Methods."
- All these demonstrations will be given at the Walter and Eliza Hall Institute, Melbourne Hospital.
- 8.15 p.m.—Professor W. MacCallum: Paper at a Meeting of the Victorian Branch of the British Medical Association at the Pathological Department, University of Melbourne.

Tuesday, November 8, 1927.

- 9.30 a.m.—Dr. F. Apperly: "Functional Disorders of the Stomach and Intestines," at Saint Vincent's Hospital.
- Mr. H. B. Devine: "Instructive and Avoidable Diagnostic and Operative Errors," at Saint Vincent's Hospital.
- 11.15 a.m.—Dr. A. J. Brennan: Demonstration on Laboratory Methods, at Saint Vincent's Hospital.
- Mr. C. Gordon Shaw: "Simple and Malignant Gastro-duodenal Ulcers," at Saint Vincent's Hospital.
- 2.15 p.m.—Dr. K. G. Colquhoun: Demonstrations on Skin Diseases, at Saint Vincent's Hospital.
- Mr. L. Doyle: "Local Anæsthesia for Hernia and Hæmorrhoid Operations," at Saint Vincent's Hospital.

Wednesday, November 9, 1927.

- 9.30 a.m.—Dr. E. R. White: "Puerperal Sepsis," at the Women's Hospital.
- 11.15 a.m.—Dr. A. M. Wilson: Obstetrical Emergencies," at the Women's Hospital.
- 2.15 p.m.—Dr. R. Fowler: "Preoperative and Postoperative Cases of Prolapse of the Female Genitalia," with surgical operations, at the Alfred Hospital.
- 8.15 p.m.—Professor W. A. Osborne: Paper at a Meeting of the Victorian Branch of The British Medical Association, at the Physiology Department, University of Melbourne.

Thursday, November 10, 1927.

- 9.30 a.m.—Dr. J. W. Grieve: "Management of Diabetes in Adults and Children," at Saint Vincent's Hospital.
- Mr. D. Murray Morton: Demonstration of Surgical Affections, in the Surgical Wards of Saint Vincent's Hospital.
- 11.15 a.m.—Mr. J. Newman Morris: "Neoplasms of the Face," at Saint Vincent's Hospital.

Dr. R. V. Hennessy: Demonstrations of Aural Diseases and Anæsthetic Apparatus, at Saint Vincent's Hospital.

2.30 p.m.—Mr. H. C. Trumble, Mr. C. J. O. Brown and Dr. R. W. Chambers: "Errors in Diagnosis," "End Results of Diseases," at the Austin Hospital, Heidelberg.

Dr. H. A. Maudsley: "Treatment of Paraplegia," at the Austin Hospital.

Friday, November 11, 1927.

9.30 a.m.—Dr. D. O. Thomas: "Disordered Function of the Colon," at the Melbourne Hospital.

Mr. W. Alan Hailes: Demonstration of Septic Conditions, in the special wards at the Melbourne Hospital.

11.15 a.m.—Dr. S. V. Sewell: "Disorders of Micturition in Disease of the Central Nervous System," at the Melbourne Hospital.

Mr. C. W. B. Littlejohn: "Feet," at the Melbourne Hospital.

2.15 p.m.—Dr. H. D. Stephens: "Common Surgical Conditions of Childhood," at the Children's Hospital.

Dr. L. J. Hood: "Clinical Examination of Children," at the Children's Hospital.

Saturday, November 12, 1927.

9.30 a.m.—Dr. R. P. McMeekin: "Toxic Goitre," at the Melbourne Hospital.

Mr. Alan Newton: "Troubles After Appendicectomy," at the Melbourne Hospital.

Monday, November 14, 1927.

9.30 a.m.—Dr. W. S. Newton: "Chronic Coughs and Their Treatment," at the Alfred Hospital.

Mr. A. J. Trinca: "Common Injuries of the Lower Limbs," at the Alfred Hospital.

11.15 a.m.—Dr. M. D. Silberberg: "Cardiac Irregularities," at the Alfred Hospital.

Mr. J. W. Kennedy: "Investigation of Surgical Diseases of the Kidney," at the Alfred Hospital.

2.15 p.m.—Dr. R. T. Sutherland: "Asthma, Hay Fever and Other Allergic Diseases."

Dr. A. B. Corkhill: "Essentials of the Modern Treatment of Diabetes."

Dr. J. F. Mackeaddie and Dr. H. L. Stokes: "Practical Electrocardiography."

Dr. T. A. Travers: "Renal Efficiency Tests."

Dr. —, Fiddes: "Clinical Pathology of Blood Diseases."

Dr. W. J. Penfold: "Lead Treatment of Cancer."

All demonstrations at the Baker Institute, Alfred Hospital.

Tuesday, November 15, 1927.

9.30 a.m.—Dr. F. B. Lawton: "Pleurisy and Empyema," at the Melbourne Hospital.

Mr. J. T. Tait: "Some Urological Cases," at the Melbourne Hospital.

11.15 a.m.—Dr. W. W. S. Johnston: "Aortic Disease," at the Melbourne Hospital.

Mr. B. Kilvington: "Treatment of Enlarged Prostate," at the Melbourne Hospital.

2.15 p.m.—Dr. C. H. Mollison: "How to Perform an Autopsy in Case of Sudden Death," at the Melbourne Hospital.

Dr. L. J. C. Mitchell: "Diagnosis and Treatment of Common Eye Lesions," at the Melbourne Hospital.

Wednesday, November 16, 1927.

9.30 a.m.—Dr. H. H. Turnbull: "Bacterial Endocarditis," at the Melbourne Hospital.

Mr. A. E. Coates: "Lesions of the Cervical and Brachial Plexuses," with anatomical and clinical demonstrations, at the Melbourne Hospital.

11.15 a.m.—Dr. L. A. Ivan Maxwell: "Modern Methods in Diabetes," at the Melbourne Hospital.

Mr. C. H. C. Searby: "Hernia; Types and Treatment," at the Melbourne Hospital.

2.15 p.m.—Dr. L. J. Clendinnen and Dr. H. F. Praagst: "Radiography and Radioscopy," at the Melbourne Hospital.

8.15 p.m.—Meeting of the Melbourne Pædiatric Society, at the Children's Hospital.

Thursday, November 17, 1927.

9.30 a.m.—Dr. L. E. Hurley: "Early Pulmonary Tuberculosis; Diagnosis; Artificial Pneumothorax," at the Melbourne Hospital.

Mr. B. T. Zwar: "Surgical Experiences Abroad," at the Melbourne Hospital.

11.15 a.m.—Dr. K. Hiller: "Experiences Abroad," at the Melbourne Hospital.

Mr. V. Hurley: "Management of Hæmatemesis," at the Melbourne Hospital.

2.15 p.m.—Dr. R. W. Chambers: "Management of Pelvic Inflammation," at the Melbourne Hospital.

Dr. J. H. Kelly: "Common Skin Diseases," at the Melbourne Hospital.

Friday, November 18, 1927.

9.30 a.m.—Dr. J. R. Bell: "Pernicious Anæmia," at the Alfred Hospital.

Mr. Fay Maclure: "Practical Points in Facial Surgery," at the Alfred Hospital.

11.15 a.m.—Dr. J. W. Mackeaddie: "Early Tuberculosis and Abscess of the Lung," at the Alfred Hospital.

Mr. Balcombe Quick: "Injuries of the Knee Joint," at the Alfred Hospital.

2.15 p.m.—Dr. H. Boyd Graham: "Manifestations of Syphilis in Children," at the Children's Hospital.

Dr. C. H. Osborn: "Management of Hernia in Children," at the Children's Hospital.

Medical Practice.

MEDICAL SERVICES IN INLAND AUSTRALIA.

IN almost two-thirds of the whole Continent of Australia called the "Inland" which comprises 2,000,000 square miles, there is no town of sufficient size to support a private medical practitioner.

For fifteen hundred miles north and south and for fifteen hundred miles east and west there is no medical man and the twenty-thousand white people scattered over this wide area are living five hundred miles or more from ordinary hospitals in places with bush tracks or no tracks at all.

The problem of bridging the wide gulfs between ordinary medical centres and supplying medical services to inlanders was first undertaken by the Presbyterian Church of Australia in 1911. In this year they placed a deaconess-nurse at Oodnadatta. Development has proceeded rapidly and the organization thereafter known as the Australian Inland Mission now comprises ten nursing homes, each staffed by two doubly certificated nurses and two homes under construction and one travelling nurse.

The Australian Inland Mission at the present time shoulders practically the entire nursing responsibilities of the inland. The nursing homes are now established at all the main inland towns where they act as social as well as nursing centres. In their social capacity and with the aid of the inexhaustible Australian Inland Mission libraries the nurses do much to dispel loneliness and by their nursing ability they create a mantle of safety and a sense of security in place of that former dread which is the greatest hindrance to family life in our outer bush.

The medical services on the borders of the inland consist on the south side of a doctor and hospital at Hawker, South Australia, a doctor and hospital at Port Augusta, South Australia, and a doctor and hospital at Kalgoorlie, Western Australia.

Hawker serves the central Australian railway up to Oodnadatta.

Port Augusta and Kalgoorlie serve the thousand miles of transcontinental line between.

A qualified chemist travels over this route once weekly on the "tea and sugar" train and prescribes for minor ailments.

On the west side there are several "outback" towns in Western Australia with resident doctor and hospitals.

On the north side there are medical men at the coastal towns, Broome, Derby, Wyndham, Darwin; Darwin serves the north Australian railway to Katherine for two hundred miles; there is a government hospital with two nurses at Pine Creek, half way to Katherine and there is a temporary medical officer attached to railway construction works at Katherine.

On the east side there is a splendid system of government subsidized hospitals with resident doctor in the western part of Queensland townships, Camooweal, Boulia, Jundah and Quilpie. In the centre of the inland area we find an Australian Inland Mission monopoly.

On the north-south line between Darwin and Hawker there is an Australian Inland Mission hostel at Narranboy, in Northern Territory, an Australian Inland Mission hostel at Alice Springs, in Northern Territory, an Australian Inland Mission hostel at Oodnadatta, South Australia, a district nurse at Maree, South Australia, and an Australian Inland Mission hostel at Beltana, South Australia.

In Northern Territory on the west side is an Australian Inland Mission hostel at Victoria River.

In Western Australia Australian Inland Mission hostels are situated at Hall's Creek and Fitzroy crossing (under construction) in the north, at Marble Bar and Port Headland in the west and at Lake Grace in the south.

In the Queensland corner of South Australia the travelling nurse is established between Innaminta and Cordillo Downs.

On the Queensland side there is a hostel at Birdsville.

There is a local first aid chest at Cooper Pedy, South Australia, where one hundred men are living on the opal fields 350 miles from a hospital.

The population of the inland is difficult to estimate, but probably 20,000 white people are served by the Australian Inland Mission hostels.

During 1926 304 in-patients and 1,375 out-patients received treatment at Australian Inland Mission hostels and 105 teeth were extracted. During the first two quarters of 1927 213 in-patients and 772 out-patients were treated and 63 teeth extracted. The Australian Inland Mission hostels are very efficiently managed and the staffs perform splendid service. The nurses are specially selected and are of very high character and ability. There is always a local committee of management and in some cases the hostel is supported entirely by local contributions. When possible and practicable the hospitals may be taken over entirely by district residents if so desired.

The hostel buildings are specially designed according to their special need. The more recent hospitals are more or less standardized on a plan resulting from experiment with various designs. The hostel at Alice Springs is the finest building in the inland, built of concrete at a cost of £7,000. It has accommodation for three in-patients in two wards. Every provision is made for comfort of nurses and patients, including electric light and fans, special ventilation system, sewerage and wireless. In all hospitals there is a liberal stock of drugs, splints, dressings and other material and everything possible is supplied to assist the nurses in their duties.

Most of the hostels are at present out of range of medical men, but it is the aim of the organizers to place every hostel within touch of medical help by wireless and aeroplanes, so that the nurses' responsibilities may be lessened.

While the Australian Inland Mission with its hostels and nurses has given an efficient service for the present needs of the inland, there is urgent need for at least one medical man in Central Australia. This newly formed State has no medical organization of any sort. Alice Springs, the capital of Central Australia, is destined to become an important centre and though there may never be a large population, it will always be an important one.

There are five thousand blacks in Central Australia and they alone present a medical problem which should not go uninvestigated.

For many years the organizers of the Australian Inland Mission have been looking to wireless and air transport

as the means of solving the greatest inland problem, distance.

Rev. J. Flynn, the Superintendent of the Australian Inland Mission has conducted experiments in the interior with wireless and investigations have been made regarding the possibilities of an aerial medical service.

A special fund of £7,000 has been raised to conduct actual experiments in this direction and it is proposed to make a start as soon as detailed arrangements can be completed. The experiment will be continued for one year and if successful, permanent aerial medical services will be established.

It is expected that by this means one doctor may be able to operate over a three hundred mile radius and therefore theoretically six flying doctors would practically cover the whole inland. It is proposed to operate in conjunction with existing aerial services, the Queensland and Northern Territory Aerial Services, the West Australian Airways and the Australian Aerial Services.

The Barkly tableland area and the country surrounding Cloncurry in west Queensland is an area admirably suited for an experimental aerial medical service. The country has greater immediate possibilities than most of the inland. It is uniformly sparsely populated. It is to a large extent good flying country.

The regular air mail route crosses the area in three lines radiating from Cloncurry, to Normanton, to Camooweal and to Winton. The present medical service comprises a doctor and forty beds in the hospital at Cloncurry, a doctor and eight beds in the hospital at Camooweal, a doctor at Burketown and one at Normanton, a doctor and forty beds in the hospital at Kuridala, a deserted mining town, a hospital at Duchess, a doctor and a hospital at Boulia, a district nurse at Julia Creek and doctors at Richmond and Winton.

The doctors are subsidized by hospital committees and for the most part have little private practice. Patients usually are brought to the doctor.

There is an excellent motor ambulance service operated throughout the area by the Queensland Ambulance Transport Brigade. Ambulances are stationed at Mount Isa and Cloncurry. At times the ambulance is called to make trips of up to a hundred miles, but the average is about thirty-five miles. For greater distance motor ambulance is recognized as unsatisfactory.

As regards motor transport, the roads are good and rapid travel is possible, but in the wet season (summer) storms are always liable to hold up road traffic for days at a time. Air travel is seldom affected for more than a few hours.

The people of the inland have long regarded the Australian Inland Mission as an organization which understands them. They know the Australian Inland Mission hospitals and they look to the Australian Inland Mission always to supply their medical needs. They have been looking to the Australian Inland Mission to commence an aerial service which they will welcome and wholeheartedly support.

Air travel in the Cloncurry area is no novelty. It is accepted as is road travel in other parts. Patients are continually being brought to hospital by the air services, but of course it is at cost which only a few can afford.

Three schemes for supplying aerial medical services were considered:

1. Aerial ambulance pure and simple, run on ordinary ambulance lines without a medical attendant.
2. Machine specially fitted as an ambulance, owned and operated by the Australian Inland Mission and to carry a doctor.
3. Machine adapted as an ambulance to carry doctor and patient, operated for the Australian Inland Mission by contract with an air service at present working.

From the small available data it seems essential for a medical man to fly with the machine, for in most cases no medical man will have seen the patient before arrival of the ambulance. It will be necessary for a provisional diagnosis to be made for first aid treatment to be rendered and the advisability of air transport to be decided on. The pilot would receive instructions in order that the trip may be satisfactory and comfortable for the particular patient. He would be advised as to the best altitude, whether to avoid if possible bumping, vibration and so

forth. First aid treatment would include special preparation for transport, the injection of morphine, the passage of a catheter, treatment of hæmorrhage and other emergency measures.

Treatment may be needed during the flight. In case of air sickness and vomiting it may be necessary to clear the mouth. The injection of morphine may be needed for patients after accident. Stimulants may be needed. Adjustments of splints and dressings may be necessary.

In exceptional cases a forced landing may be advisable. This decision could be made only by a competent observer and the pilot should not be asked to land unless absolutely essential.

The pilot has his own responsibilities and should not be expected to have any worry concerning his passengers. The medical attendant takes all responsibility for the safety of the patient.

For the above and other reasons it is considered essential that a medical man should fly with the aeroplane and return with the patient. This means that the first scheme would not be satisfactory. As regards the second scheme, a machine owned by the Australian Inland Mission, a single machine without organization would be practically useless in the inland regions of Australia. For this reason the scheme cannot be considered and therefore the third proposal is the only one likely to work. The scheme will present many difficulties, but I am convinced as a result of investigation in the area that it is quite practicable. It will be impossible to formulate a code of rules and arrangements for the working of the scheme until it is actually in operation. It must necessarily be experimental at first; rules made at first will be broken and changed and gradually a working organization may be evolved which will later be applicable to other centres.

There will be the difficulty of communication, for the call must come first to the doctor and rapid communication is the first essential to an efficient medical service.

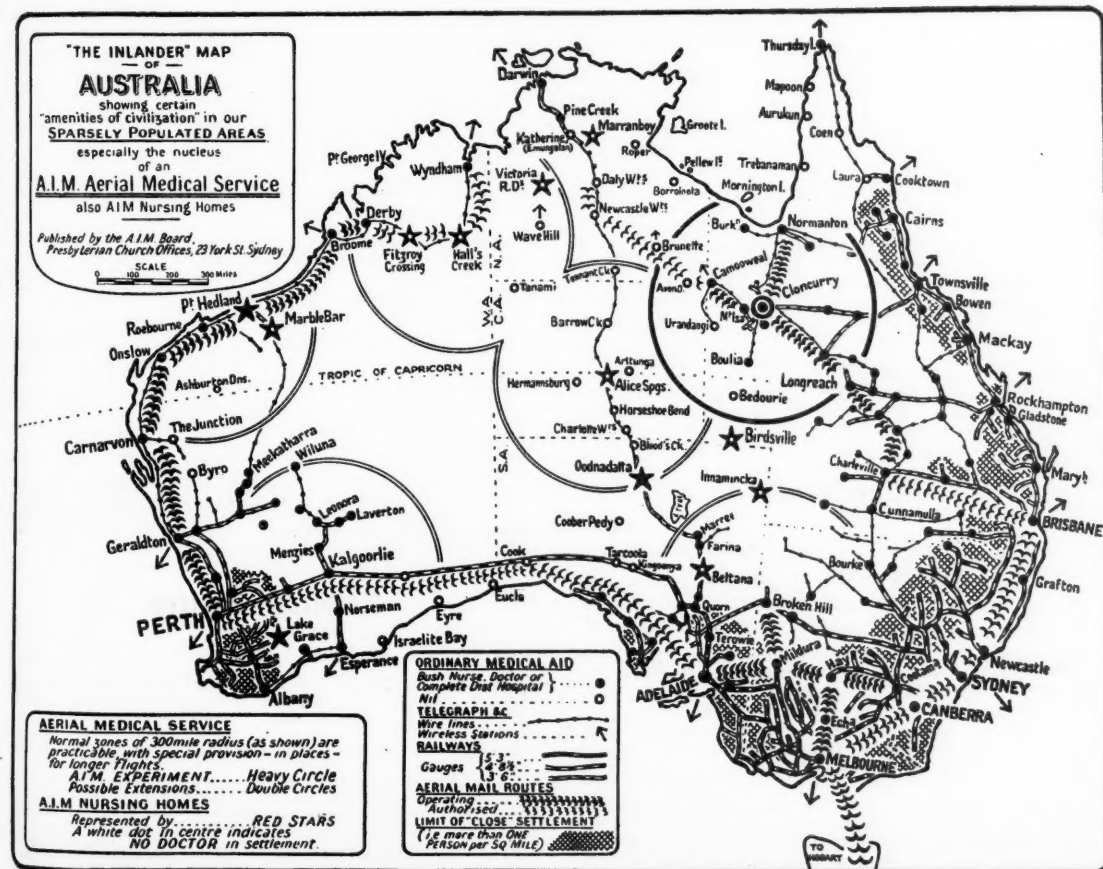
There is a skeleton telegraph and telephone throughout the Cloncurry area. There are wires as far west as Avon Downs and as far south as Boulia and Urundangi and north to Normanton and Burketown. Brunette Downs has wireless.

For the most part the stations are completely isolated and it is in the development of wireless that the possibilities are greatest. Recent experiments carried out by the Australian Inland Mission proved that a cheap reliable short distance set can be produced. It is hoped by establishing these at strategic centres in touch with a central station to supply communication to the whole area.

The possibilities of using carrier pigeons might also be considered for urgent messages. This method is used in parts of the inland. It seems essential to first develop communication, but useful calls will come from the present system. Still the object of the scheme should be always to get beyond the existing systems, to supply a medical service to people at present having none, not to better a service which may at present be quite good.

There are many problems connected with the working of the aeroplane. These have been solved by Qantas (Queensland and Northern Territory Aerial Service) which has the highest efficiency record and whose aeroplanes fly about forty thousand miles a month in Queensland. It will be necessary to establish new landing grounds, so that every home can be reached, but ready cooperation of the local residents will make this an easy task.

For efficiency of service and organization Qantas is the ideal service to supply the aeroplane and the contract



which has been proposed, namely that they have continuously available at Cloncurry one aeroplane fitted as an ambulance for the use of the Australian Inland Mission doctor, is very sound.

The "D.H.50" machine is a standard type with Qantas and it is practically ideal as an ambulance. The cabin is easy of access. It is long enough to carry a stretcher and wide enough to allow an attendant to be beside the patient and to attend to him. Its flying performance is fine and the special type of undercarriage renders landing particularly free from bumping. There is also easy means of communication between the pilot and the doctor in charge of the patient.

The question of overlapping of existing medical and ambulance service has been considered. The medical men in the area are all subsidized by hospital committees and have little private practice. They are all isolated and in every case said they would welcome a "flying doctor" who would be available for consultations and for anaesthetics.

The ambulance is generally accepted as being chiefly useful for distances under fifty miles. The usefulness of the aeroplane would commence at fifty miles, so there could be no question of overlap. We found the local ambulance authorities enthusiastic supporters of the scheme.

The flying range has been set down at from 250 to 300 miles, greater distances being possible in special cases.

Cloncurry is most suitable as a base because it has a hospital and is the aeroplane base. Qantas have always at present a spare aeroplane and pilot at Cloncurry; this would be kept exclusively for the aerial medical service, but not necessarily always the same aeroplane, thereby allowing periodic overhaul without interruption.

The object of the experiment is to demonstrate that by means of air transport a doctor can extend his services over the flying range. Therefore it is suggested that his work be:

1. To attend patients in emergency and after accident, to render first aid treatment and if advisable to transport them by air to the nearest suitable hospital where they will be transferred entirely to the local staff.

2. To pay regular visits to places at present entirely outside the medical area for the purpose of attending patients with chronic affections.

3. To be available when desired for consultations with local doctors.

The Australian Inland Mission medical man will be subsidized by the mission and will personally receive no fees. He will have no private practice. The actual working of the scheme will be controlled by a local committee acting under direction of the Australian Inland Mission board.

It is hoped that all private practitioners or those with Government or local subsidies will allow the "flying doctor" to visit the different hospitals frequently and to see their patients and thus to refresh his experience and relieve the monotony of his existence when not on flying duty.

Obituary.

WILLIAM EDWARD JOHN PARADICE.

CHARLES WILLIAM REID.

ROBERT LEE BROWN.

On Thursday, November 3, 1927, the whole of Australia was horrified by the news of the sinking of the ferryboat *Greyhiffe* on Port Jackson, Sydney. Among the many who lost their lives, were Surgeon-Lieutenant-Commander William Edward John Paradise, Royal Australian Navy, Dr. Charles William Reid, Quarantine Officer, and Dr. Robert Lee Brown. The dramatic suddenness and appalling circumstances of the tragedy have evoked a note of deep sympathy with all those whose relatives perished through the collision. The sympathy of the medical profession is especially directed to the relatives of these three eminent men. An account of their careers will be published in a subsequent issue.

Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCH.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 30 - 34, Elizabeth Street, Sydney.	Australian Natives' Association. Ashfield and District Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham Dispensary. Manchester United Oddfellows' Medical Institute, Elizabeth Street, Sydney. Marrickville United Friendly Societies' Dispensary. North Sydney United Friendly Societies. People's Prudential Benefit Society. Phoenix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association Pro- prietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Hon- orary Secretary, B.M.A. Building, Adelaide Street, Brisbane.	Members accepting appointments as medical officers of country hospitals in Queensland are advised to submit a copy of their agreement to the Council before signing. Brisbane United Friendly Society Institute. Stannary Hills Hospital.
SOUTH AUSTRALIAN: Secretary, 207, North Terrace, Adelaide.	All Contract Practice Appointments in South Australia. Booleroo Centre Medical Club.
WESTERN AUS- TRALIAN: Honorary Secretary, 65, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.
NEW ZEALAND (WELLINGTON DIVI- SION): Honorary Secretary, Wellin- gton.	Friendly Society Lodges, Wellington, New Zealand.

Medical practitioners are requested not to apply for appointments to position at the Hobart General Hospital, Tasmania, without first having communicated with the Editor of THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales.

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All communications should be addressed to "The Editor," THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, Sydney. (Telephones: MW 2651-2.)

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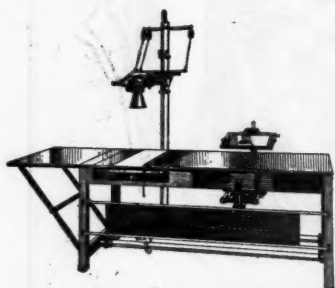
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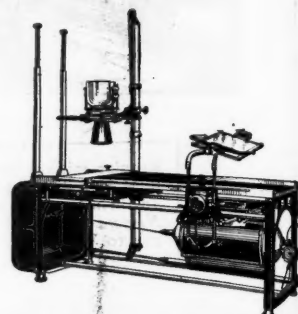
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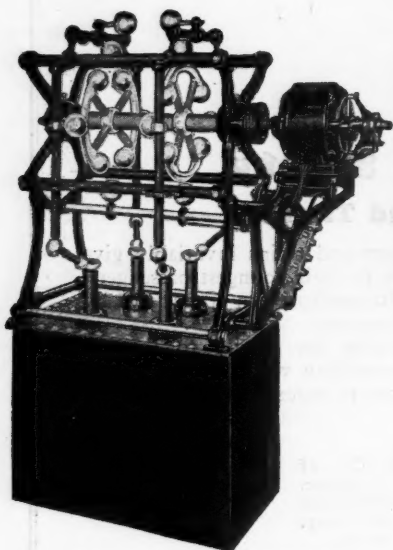
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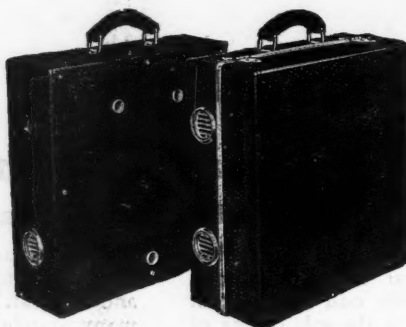
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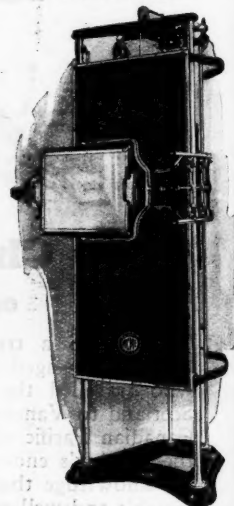
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I am specially interested in Dr.
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